MINING CONGRESS JOURNAL

RIL, 1938

FICIAL

ATTENTION Coal Mining Men!

YOUR I.Q.

Allow 1/10th second for each question. A 20% count for each correct answer. 100% total definitely rates you an "on-your-toes" coal mining man.

1 What important event will take place for the coal mining industry at Cincinnati, Ohio, May 2-6, 1938?

2 Where will thousands of coal mine officials and their men hear first-hand how the other fellow is working out many difficult operating problems?

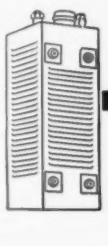
3 Where will thousands of coal mine officials and their men see first-hand the most up-to-date and efficient mine equipment and machinery, much of it in actual operation?

4 Where will thousands of coal mine officials and their men be entertained in royal fashion this Merry Month of May?

5 Where are you going to be the week of May 2nd? (*If you miss on this one, you'll really be missing something.*)

Answers on Page 45

LAUGH AT BROKEN TRACK BONDS!



The best way to laugh at broken track bonds, trolley wire and trolley poles is not to have any. In many modern mines the trolley wire system is obsolete altogether. No more holding up of production. No more fire hazard. No more electrical dangers. No more spats between motorman and shift bosses. Storage battery locomotives end all that.

Had the storage battery locomotive only eliminated worry, expenses and nuisance about trolley wire, it would have earned its place in modern mining. But it has done more. In some mines it has reduced power costs, because by alternating hoisting and battery charging loads the peak is kept down. In all mines it permits bringing electric haulage closer to the working places.

And it is the battery which Thomas A. Edison invented—the steel-alkaline battery—which stands up under the slams, bangs, derailments of mine service. The Edison is built of the sturdiest material known—steel. It can't sulphate, cannot shed active materials, won't fail suddenly. And, it will have 2 to 5 times the life of the ordinary battery. Write for new data on mine haulage.

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DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

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for flexibility—
greater tonnages—
lower cost coal
production . . .

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JOY MANUFACTURING CO.
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THIS PHOTOGRAPH tells the whole story of LUMP COAL C*, the Du Pont Permissible used in more than sixty modern bituminous mines.

LUMP COAL C* brought down this coal—still in large, firm lumps after loading. Minimum degradation, maximum profit.

Even more striking is the illustration of the slow, heaving action of LUMP COAL C*.

For the drill marks are still there—proving that this outstanding permissible does not shatter coal. Its action more nearly approximates the slow heave of black powder than any other permissible.

LUMP COAL C* is well adapted for mechanical loading. Because of its maximum spreading action, it shears ribs clean, practically eliminating tight or hanging shots.

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CINCINNATI, MAY 2—6, 1938

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MINING CONGRESS JOURNAL

Vol. 24 APRIL, 1938 No. 4

The May Issue

In the mail April 23, will bring you complete details on the 15th Annual Coal Convention and Exposition, as well as a splendid group of operating articles featuring various phases of coal mining.

CONTENTS

Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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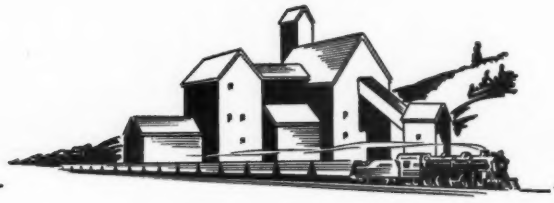


Protection, Not Punishment

THE growing increase in crime in the United States is, perhaps, to some small extent, to be charged to the unemployment situation, but to a far greater degree it is caused by those silly sentimentalists who continually strive to make penalties lighter and easier to bear.

It is most unfortunate that those who work for prison comforts misunderstand so completely those who firmly insist that all criminals shall suffer adequate penalties. This is perhaps because of a difference of belief as to whether penalties are imposed for the purpose of punishment of the offender or as a means to provide protection for the law abiding. The best impulses as a whole do not call for punishment as such but as a means of prevention. There are those to be sure who believe that crime is a disease and that kindness is its only cure. This theory seems to have its complete denial in the fact that so many of the most atrocious crimes are committed by paroled convicts upon whom the kindness remedy has only fostered their courage to commit more brutal crimes.

The real question is whether the hundred law-abiding citizens shall be in continual jeopardy in order that one criminal shall be coddled by silly sentimentalists.

The writer has no desire to see any one punished but he has a well-defined, ardent desire to see every cititzen protected. If any are to suffer it should be those who are guilty, not those who observe and respect the rights of others. Whatever penalty is meted should not be done through a desire to punish for past offense, but for the purpose of preventing future offenses, not only by the culprit himself, but by all those who will be influenced by his example.

It has been stated by a leading criminologist that of the 75,000 men and women who leave the country's prisons annually, 50 percent are returned for post graduate courses—in other words, each year 37,500 criminals are turned loose to prey upon the law-abiding citizens. Already these citizens have been taxed from $7 to $10 per day for years to pay the expenses of convicts who now are turned loose upon our communities with increased skill as criminals and knowing better how to escape detection. Shall we coddle these men at the expense of the law abiding?

Moses, the first great law-giver, may have been a little harsh as applied to the criminally untrained pastorals of that day, but the writer believes that today his ediet is timely that "thine eye shall not pity." There are few right thinking people who do not feel a first impulse to excuse and to forgive the offender. The writer is not an exception to this class, and yet he realizes that such sympathies add to the suffering of those who do not deserve punishment to a far greater extent than they bring relief to those who make crime a business.

Swift certain penalties, not as punishment of the criminal, but for the protection of those for whom governments are created and maintained seems to be the most effective remedy.

J. F. Callbreath

A JOURNAL FOR THE ENTIRE MINING INDUSTRY—PUBLISHED BY THE AMERICAN MINING CONGRESS

MINING CONGRESS JOURNAL

Vol. 24 APRIL, 1938 No. 4

Richard J. Lund, Editor

THE ANSWER ON POLLUTION

IN view of the fact that Congressional action regarding stream pollution is still pending, references thereto in a recent report of the National Resources Committee on "Drainage Basin Problems and Programs—1937 Revision," transmitted to Congress with a message from the President on March 10, assume real importance.

In discussing legal aspects of the pollution problem the report states: "The power to control pollution rests with the several States. It has been well established by the courts." Again, in defining a national policy for pollution abatement, this position is affirmed.

This conclusion by an agency of the Administration would certainly seem to preclude any thought of the enactment of a Federal mandatory water pollution law such as is contemplated in the harmful Lonergan amendments to the Vinson bill now pending in conference.

MINERALS IN WORLD UNREST

RECENT European events lend additional force to the thought advanced by C. K. Leith in a radio talk of March 24 over the British Broadcasting Corporation network, to the effect that minerals are playing a most important role in present world unrest and that democratic countries who now possess the cream of mineral resources may be forced ere long to defend their strategic positions against the steady pressure of the "have nots." His talk is carried in full on page 35 of this issue.

Basically the argument resolves itself into the old theme of "nationalism" versus "internationalism." Dr. Leith's view is that a policy of isolation by the United States will lead to dire consequences—indeed, that such a course in event of a serious European conflict will be impossible to pursue.

Recognizing the controversial character of the problem, it is still highly desirable to view the situation objectively from all angles, and consequently this studied brief analysis is worthy of the attention of all interested in the ultimate welfare of our country.

FOR METALLURGICAL RESEARCH

FINAL passage and approval by the President of the bill authorizing construction and equipment of a U. S. Bureau of Mines Experimental Station at Salt Lake City brings to a happy conclusion years of intensive effort by many persons and organizations interested in the welfare of mining. While those in and near Salt Lake City who have led the movement may well feel particular gratification over this action, the mining industry of the entire West will be greatly benefited by research that will be done there, developing improved methods of mineral extraction, recovery and use.

Situated as it is in the geographic center of the western mining area, and with the many world-famous metal operations in its immediate vicinity, Salt Lake City provides an ideal location for such a nucleus of metallurgical research. It is understood that this will not supplant the present research stations of the Bureau at other points in the West, which will continue to meet the particular needs of the area in which each is located.

Although the bill providing for the construction of the station contains a section authorizing appropriation of the $300,000 "out of any money in the Treasury not otherwise appropriated," further action is necessary before the money becomes available for expenditure. It is greatly to be hoped that no undue delay will be met in carrying through the final step necessary, so that construction work may be started at the earliest possible moment.

Lower tipple, incline and top tipple

Monitor Haulage with Electric Braking

- ***Regenerative Principle in Braking Has Effected Marked Economies Over Gravity or Dynamic Types at Bergoo Mine Number 2 of Pardee & Curtin Lumber Co.***

By A. FRED PHELPS and T. K. DAY
Genl. Mine Supt.
Pardee & Curtin Lumber Co.

IN Webster County, West Virginia, the Pardee and Curtin Lumber Company is producing a very high quality bituminous coal known to the trade as "Bergoo Coal," mined from the Sewell seam. This seam of coal is located approximately 900 ft. vertically above the main stream level. In lowering the coal, monitors are used on the inclines from a storage bin at the dump to a similar bin at the preparation tipple.

At the Bergoo Mine Number 2, near Webster Springs, W. Va., where the production is about 2,500 tons per day, three different types of monitor hoists were tried before installing the present Link-Belt Company machine.

The previous lowering machines used at this mine were of the tandem drum, gravity type, with oversize friction brakes. The 2,000-ft. incline being comparatively steep, this type of machine proved unsatisfactory due to the excessive heat generated by the brakes. The large brass bearings, the asbestos brake blocks and the machine bolts required constant attention.

Due to the frequent delays, loss of tonnage and high maintenance cost of these gravity type machines, it was decided to install a machine using the regenerative braking principle.

There have been a few instances in which monitor lowering machines have been equipped with more or less make-shift means for lowering monitors with the aid of dynamic braking, but it is believed that the first machine to employ regenerative braking is the one described here. This was designed and built by the Link-Belt Company for use at Bergoo Mine Number 2. This equipment was put in operation on or about November 13, 1934.

Description of Equipment

The principal data pertaining to the monitors in use are:

Weight of loaded monitor—each ..	44,000 lbs.
Weight of empty monitor—each ..	14,000 lbs.
Size of cable	1¼ in.
Distance traveled ..	2,100 ft.
Drop in elevation ..	800 ft.
Nominal speed	800 ft., per min.
Time for one trip.	2 min. 40 secs.

The haulage machine is set on a structural steel base, and is of the double drum type having renewable grooved rings, those on one drum being of the compensating slip-ring type. One drum is coupled to a double reduction herringbone gear, which in turn is coupled to a 200 Hp., 900 r.p.m., Westinghouse type CW induc-

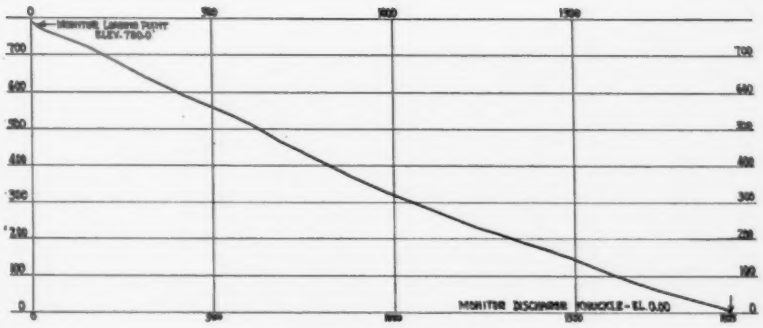
tion motor wound for 440 volts, 3 phase, 60 cycles.

The 9-in. drum shafts rotate in Shafer self-aligning roller bearings. Anti-friction bearings are used throughout. The driving drum is equipped with a double acting band brake which is normally thruster released, but which may be released by hand as well. The speed of the drums is held constant at 61 r.p.m., corresponding to a rope speed of 800 ft. per minute.

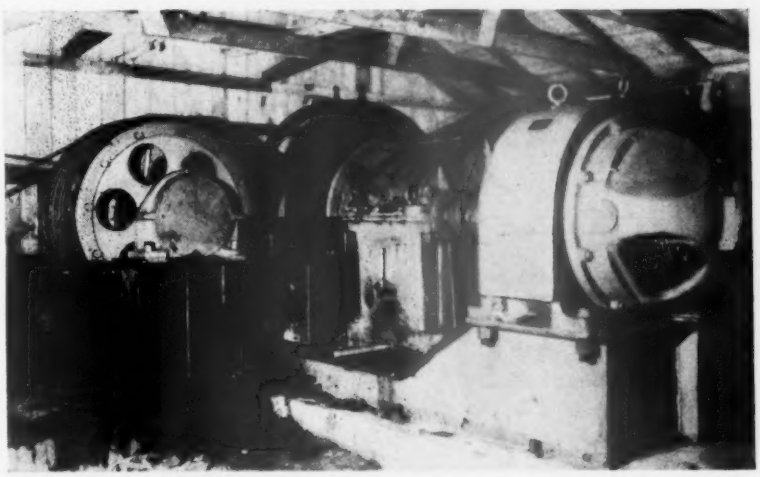
The front or idler drum has each groove machined in a separate steel ring, and these rings are assembled loosely on a straight face machined on the drum. This construction was used to equalize the tension in the rope while passing around the drums.

The starting panel is a Westinghouse special contactor type panel with forward and reverse main contactors mechanically interlocked, and four secondary contactors which cut out resistance in the rotor circuit on a definite time schedule. There is also included the usual overload, undervoltage and overtravel relays.

The control station consists of a master switch having only a forward and reverse position.



Profile of incline



Monitor lowering machine

15-ton monitor

Simple, Automatic Operation

The operation of the machine is completely automatic and very simple. When the upper monitor is loaded, the operator moves his master switch to the appropriate position, thereby closing the directional line contactor. There is just the right amount of resistance in the rotor circuit to produce a torque sufficient to balance the load imposed by the empty car and cable. This permits of the maximum acceleration of the loaded car by gravity without paying out cable from the drums faster than the movement of the loaded car will permit.

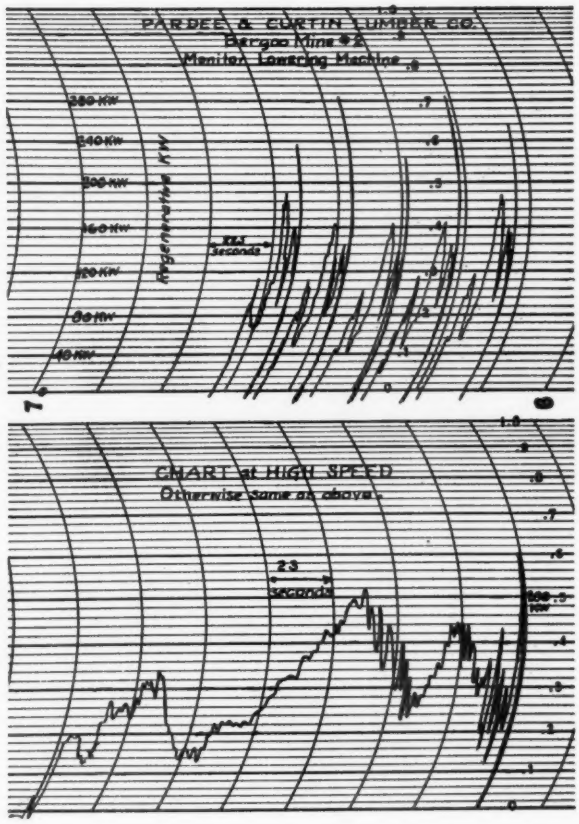
When the loaded car has accelerated the motor to synchronous speed, a flyball governor closes a switch which energizes the final accelerating contactor. This throws the motor across the lines with the minimum of disturbance. At about 10 percent above synchronous speed the flyball governor disconnects the motor from the power supply and sets the brake, thereby protecting against any contingency other than rope breakage which might cause the monitors to tend to run away. Additional accelerating points are provided to accelerate the motor if it is desired to run the monitors without load or to hoist a load up the hill.

When the upcoming monitor reaches a certain point the operator moves his master switch to the off position, thereby disconnecting the motor and de-energizing the brake thruster. Since the brake is trip free from the thruster, the operator skillfully manipulates the hand lever on the brake and brings the monitor into loading position.

Advantages of Regenerative Braking

Regenerative braking offers some very decided advantages over either friction braking or dynamic braking. The disadvantages of friction braking arise largely from the enormous heat losses which must be dissipated by the brakes. Similarly, with dynamic braking there is great heat lost, which, however, is conveniently dissipated through banks of resistors. Since the speed torque curve in dynamic braking originates at zero speed, this type of braking gives a variable speed to monitors as the speed changes with a change in load. With regenerative braking, the speed-torque curve originates at synchronous speed and gives a virtually constant speed regardless of load. Constant speed is more favorable to brakes, ropes, rails, and the monitors, and there is not the danger that the operator might be tempted to let the monitors attain higher and higher speeds with the probability of losing control.

Another important advantage derived from the use of regenerative braking lies in the fact that useful power is being generated and pumped back into the system to be used for driving other power consuming equipment in the tipple, mine and shops. Reference to the accompanying graphic watt-meter chart will well bear out this point. The upper chart, at slow speed, shows several trips. Note how consistently the changes in grade are recorded. The lower chart shows one cycle with the chart at high speed. Current leads to the meter were reversed, of course, to show the generated power. A cycle in which about 13.2 tons of coal were lowered in a monitor showed approximately 4.8 k.w.h. generated in 2 minutes 40 seconds; at 20 trips an hour this represents a power saving of about 96 k.w.h. The duty on the motor is one of torque requirement rather than a heating duty.



Watt-meter charts, showing amount of current returned to power lines through regenerative braking. Upper chart shows five trips, and lower chart the record of one trip with chart moving at high speed

Economies Effected

From an operating and maintenance standpoint this entire installation has been very satisfactory. No time has been lost from electrical or mechanical failure, and over a million tons of coal have been lowered with no cost for repairs. Track maintenance on the incline has been greatly reduced, and wrecks have almost been eliminated. Very definite savings are shown in the lubrication costs of this machine compared with the gravity types formerly used. Under the present conditions the motor temperature never exceeds safe limits.

A track type limit switch may be located at a point below the opposite loading chute which will stop the load by cutting the motor loose from the power system and apply an auxiliary brake.

Protective and Emergency Features

The protective and emergency features of this type of machine are:

1. If for any reason the motor overspeeds beyond the normal speed by about 10 percent, all power is cut off and the auxiliary brake is set.

2. In normal operation the operator cannot reverse the connections to the motor without first bringing it to a standstill. This precludes unnecessary "plugging" of the motor with consequent peak demands from the power system.

3. The thruster which releases the auxiliary brake is mounted on a toggle mechanism which can be tripped in an

(*Concluded on page 54*)

Monitor control panel

Surface plants of New Orient mine at West Frankfort, Ill.

SECTIONALIZING the World's Largest Mine

A. G. SHAFFER

By A. G. SHAFFER

FOR the past several years New Orient has been 100 percent mechanized with production averaging 10,000 tons for a seven-hour shift. The stream of coal moving into the shaft bottom is transferred from the mine cars by a rotary dump to 13-ton skips, operated by a step-drum hoist having direct-connected 2,000 hp. motors on either end of the shaft. To maintain this daily tonnage, each skip must complete a round trip up the 500-ft. shaft to the tipple in about a minute of time throughout the shift.

The mine plan is unusually regular with the main haulageways forming a large letter U. The working sections are located off both open ends of the letter, and each side of the mine produces approximately 5,000 tons during the shift.

In a plant where a single lost minute of underground operation takes a toll of 24 tons of production, every detail of mining must be in close synchronism. Time, tonnage and earnings become almost synonymous terms at New Orient, so close appears the relationship between the three. When the existing high production schedules were being originally planned, automatic reclosing sectionalizing circuit breakers were given early consideration as the most practical means of avoiding costly time losses in preventing the spread of electrical disturbances on the extensive trolley and feeder system. The mine was started in September, 1924, and the first sectionalizing breakers went into service that same year. Since that time additions have been made at regular inter-

\+ + +

A. G. Shaffer, the author of this article, is in charge of underground electrification of the New Orient Mine of The Chicago, Wilmington and Franklin Coal Company, at West Frankfort, Ill. He has long been associated with the coal industry in the southern part of that state, and is recognized as a pioneer and authority on mine power sectionalization.

When 15,174 tons of coal had been hoisted up the main shaft of the New Orient Mine during a regular eight-hour day shift in March of 1928, a world's production record was established that is still "tops" in the industry after a period of 10 years.

The mine is equipped both above and below ground with a size and capacity of apparatus which might indicate the company had been thinking in terms of superlatives from the time the ground was first broken. Careful planning in combination with an exceptionally efficient layout has permitted an enormous production to be maintained without great effort on the part of either men or machinery. So, when a new record for the movement of coal from a single mine opening had been made, it was apparent that the tonnage had been anticipated long before its actual accomplishment.

The remarkable productiveness of the New Orient Mine results from something more than what is probably the most extensively mechanized plant in the industry. It reflects the presence of a highly trained operating personnel which has been directly responsible for much of the original design and construction of that plant, and a policy of management reaching for maximum efficiency in every department of mining.

Mr. Shaffer's description of the development and operation of the D.C. distribution system at the world's largest mine is of genuine interest to mining electrical men everywhere. His own relation to the construction and maintenance of that system makes his position one of the most important in the industry.

vals as the development of the mine progressed.

Sectionalizing Pioneered at New Orient

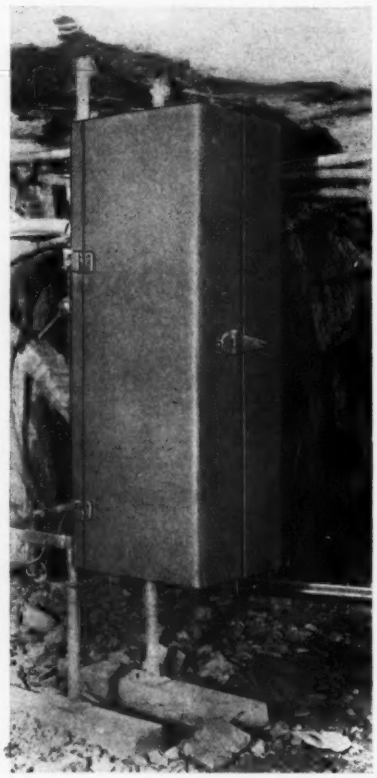
The scheme for the location of the sectionalizing breakers at New Orient was begun when the idea was still young in the industry and the management has had an important part in pioneering the use of this class of apparatus. The manufacturer has cooperated by meeting new conditions of service as these presented themselves. Many of the circuit breakers had been originally installed on the switchboards in the substations, and certain of the haulage and mining circuits were then sectionalized from these points. As the mine developed, the breaker locations were changed when the substations were decentralized and the individual generators were moved near the load centers. It then became no longer practical to control remote sections from individual circuits out of the substations.

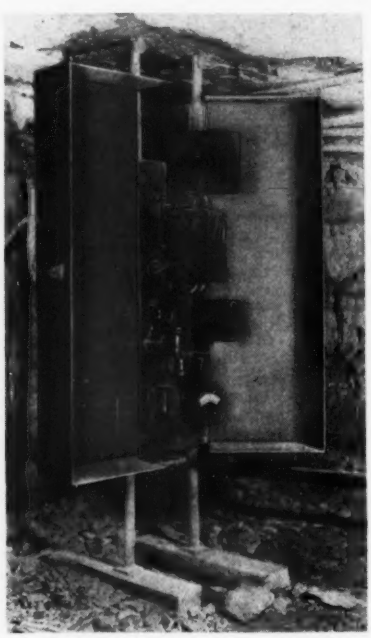
Sheet steel asbestos-lined boxes were made for the switchboard breakers, and these were then transferred to their new locations in the station tie lines along the main entries or in the feeders at the beginning of branch circuits serving the mechanized mining centers. In more recent years this practice has been continued and the company has standardized on Type KSA switchboard breakers mounted in steel covers built in the mine shops. Another factor in the choice of installation has been to limit the stock of part times through standardization.

Eight motor-generator set substations, supplied by 4,160 volt A.C. power purchased from the lines of the utility serving the district, have a total rated capacity of 3,700 kilowatts at 250 volts, D.C., and feed the underground distribution network which furnishes energy to 7,275 hp. of connected D.C. load. Thirty-four mining machines, 33 loading machines, 2 entry drivers and 63 locomotives comprise most of the D.C. load.

Pumping a Minor Item

The mine is comparatively dry, and pumping problems are not of great importance. Only 15 5-hp. gathering pumps are needed to collect the water at each of two sumps from where 200 g.p.m. centrifugal pumps discharge through bore holes to the surface. All generator units are either of 300 or 500 kw. rating, and with a single exception all are located in individual underground substations. Three of four 300-kw. machines are in portable substations located out near three of the main load centers created by the mechanized mining units. All of the generators are in operation when the mine is running, none being used as an auxiliary standby.





Above—Double-door sheet steel cabinets, made in the company's own shops, protect the panels against wrecks and adjusting by unauthorized parties

Below—The breakers are mounted on 1¼-in. pipe uprights near the rib and are moved to new locations as conditions indicate

Power for Haulage

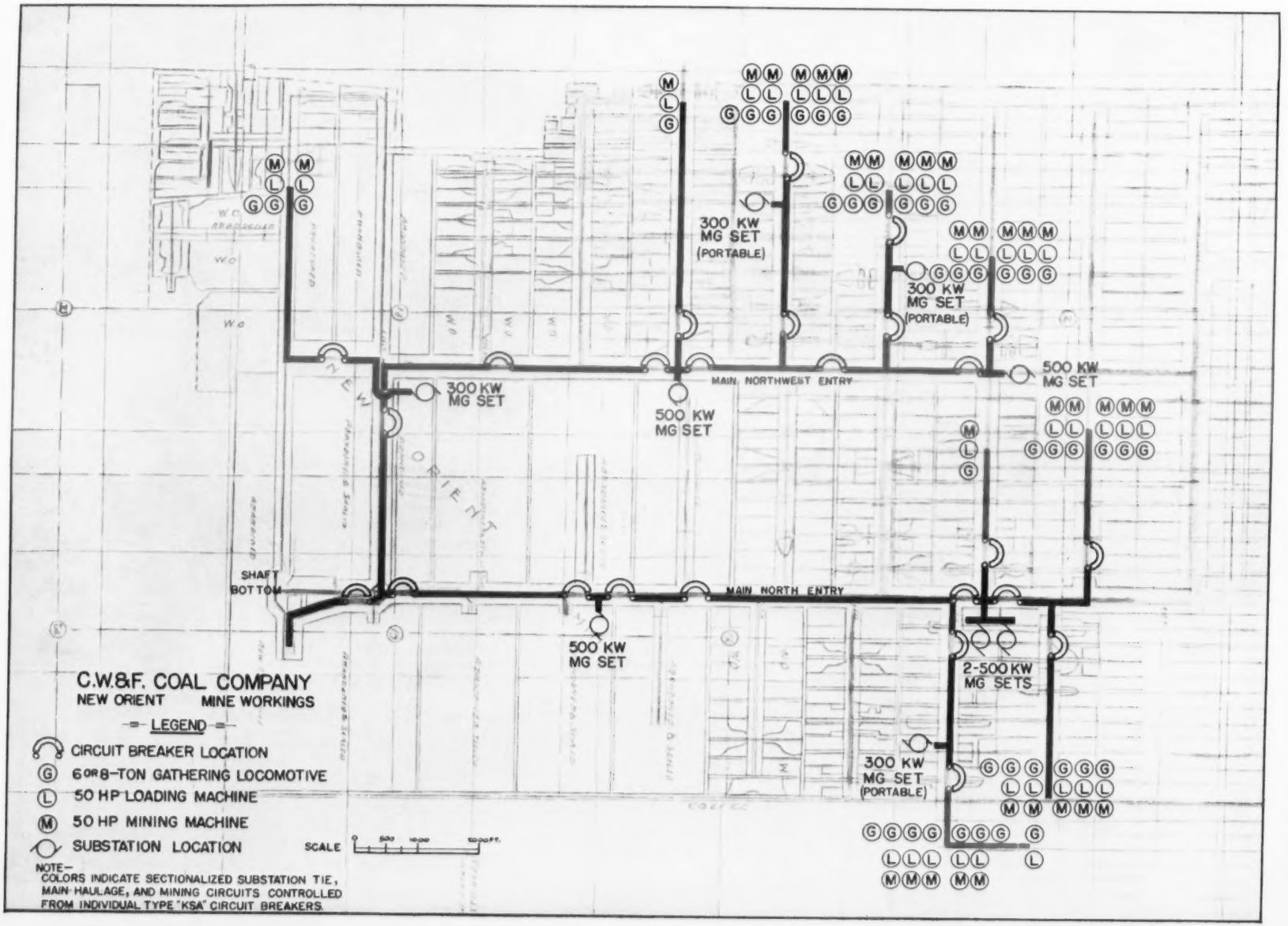
There are over 7 miles of double-track, main haulage entries at New Orient carrying 6-nought grooved and lubricated trolley over each track. Current for the locomotives is obtained from glider type trolley collectors. A minimum size cable of 1,000,000 CM is used as a feeder interconnecting the substations to form the main U-shaped system. The stations are spotted at intervals along both main north and main northwest haulageways and are about equally divided for capacity. All are full-automatic in operation excepting the portable units, which are semi-automatic only.

Both main haulage entries at New Orient are maintained with heavy steel and the roof kept in excellent condition. Fully automatic track signals with colored lamp switch boxes on all facing switch points speed the schedules and eliminate many interruptions. So great is the volume of coal in transit along the main haulageways that only a small section of it must ever be stopped during overload or short-circuit emergency periods. Otherwise, the penalty of 24 tons per minute of delay might be exacted and output on the tipple suffer accordingly.

At New Orient the main haulage is considered more the backbone of the mine than at plants having smaller tonnage. It is served by seven 13-ton, two 15-ton and two 20-ton locomotives which only operate in the main haulage entries. Connection between them and the working panels is maintained by 8- and 10-ton swing locomotives. Within the mining sections themselves, 6- and 8-ton gathering locomotives shift the empties and loads, and collect the trips for removal to the main haulage.

Sectionalize by 24 Circuit Breakers

Twenty-four automatic reclosing circuit breakers sectionalize the haulage and mining circuits at New Orient. The location of the breakers is shown on the accompanying map, which does not indicate the breakers on the switchboards of the substations. The breakers range from 1,600 to 4,000 amperes in rating, and 14 of


300 KW MG SET (PORTABLE)
300 KW MG SET (PORTABLE)
500 KW MG SET
MAIN, NORTHWEST ENTRY
300 KW MG SET
500 KW MG SET
NEW ORIENT
SHAFT BOTTOM
MAIN NORTH ENTRY
500 KW MG SET
2-500 KW MG SETS
300 KW MG SET (PORTABLE)
C.W.&F. COAL COMPANY
NEW ORIENT MINE WORKINGS
LEGEND
CIRCUIT BREAKER LOCATION
6 OR 8-TON GATHERING LOCOMOTIVE
50 HP LOADING MACHINE
50 HP MINING MACHINE
SUBSTATION LOCATION
SCALE
NOTE—
COLORS INDICATE SECTIONALIZED SUBSTATION TIE, MAIN HAULAGE, AND MINING CIRCUITS CONTROLLED FROM INDIVIDUAL TYPE "KSA" CIRCUIT BREAKERS.

A 50-HP loading machine at the face of a room. "Shorts" and overloads in one section do not penalize operations beyond the small area of their origin

them are installed in the substation tie lines along the two main haulageways.

All of the automatic stations are located close by the haulageways and feed into the distribution system through two breakers—one feeding the north end of the system and the other the south end. Under this scheme there are always two breakers between each pair of adjoining substations on the opposite ends of the same feeder. At least one breaker is then located approximately in the middle of the tie-line feeder. The tie-line breakers serve two purposes: (1) To separate the substations in event of an overload or fault anywhere between them thereby preventing low voltage conditions on that section of the network, and (2) to further divide the important main haulage into small units and prevent any great hindrance to the steady outbound tonnage flow.

The breakers in the tie lines between the portable stations and the main haulage feeders function the same as the other tie-breakers, excepting that they are not required to supply the main haulage load. However, they are of sufficient capacity to permit the entire load of the panel working section being carried in event of the portable stations being out of operation for any reason.

Heavier Tie-Line Breakers

The substation tie-line breakers at New Orient are considerably heavier in rating than are commonly found at most mines. The reason is that the main haulage locomotives are large and there is no standby substation capacity. Consequently, it is necessary in emergency, when one of the substations is not operating, to feed through the tie-breakers and beyond with a heavier current than is required under normal operating conditions when the breakers merely handle exchange current between the stations. This is a good provision and one that may be overlooked when a layout is being planned. During the periods described, the overload settings of the tie breakers are moved upward, and later lowered when the out station is again back on the line. Ordinarily the tie-line breaker settings are low so as to make the instruments more sensitive to line trouble on either side of them. With large feeders and carefully bonded heavy rail for the return, the main haulage entries are kept in top voltage, except during the emergency intervals.

Mining Concentrated as to Time and Location

While there are a few exceptions, most of the cutting, loading and tramming of the coal at New Orient is done on the day shift. The load therefore is not purposely staggered throughout the entire 24 hours with a view toward trimming power costs by operation on lower utility "off" peak period rates. It is believed this scheme of mining is more efficient for the large scale production at the New Orient mine than would be a multiple-shift arrangement of some kind with a more complex operating schedule.

The active mining sections cover large areas, but follow precise orderly plans of development. Progresssion is remarkably uniform, and, considering the large numbers of machines in use, these sections are highly concentrated —a characteristic, of course, of fully mechanized mining.

Each panel section under development supports five mining machines, five loading machines and six or seven gathering locomotives principally of 8-ton rating. These mechanized panel units represent about 1,000 hp. of connected load. On pillar work during retreat the same panel supports but a single mechanized unit. At the time the accompanying map was made, there were six full panel sections on development, three from each side of the mine, and three on retreat. Two entry drivers were opening a new section of the property in the northeast, being served by a single loading machine and gathering locomotive.

Sectionalizing breakers also control each active panel territory under development and prevent power disturbances in one from causing interruptions in others. In each of three of the working sections a portable substation is located, and these areas are further sectionalized by an additional breaker beyond the station. This practice divides the duty on the breaker located at the panel entrance, and effectively blockades "shorts" and "overloads" from the upper panel territory into the lower haulage areas.

Safety Features

The breakers installed on the outbound side of the portable stations feed independent circuits only, and being located nearer the working face than any of the other units, they can be adjusted to open on lower current values. These instruments provide more protection against fire hazards near the face, than any of the others, especially when the portable stations themselves are not on the line.

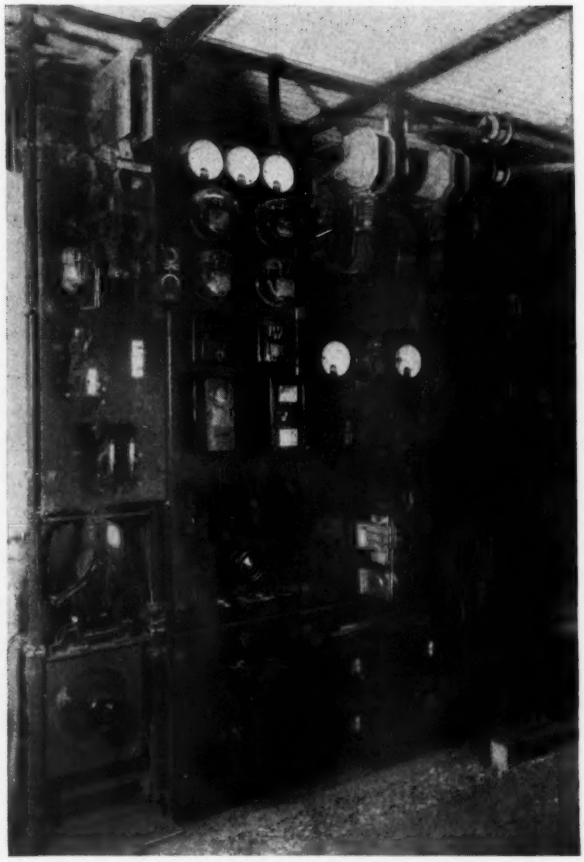
The three sections which are energized from the respective portable substations are maintained as separate feeder systems during normal production periods, and each station is capable of meeting all legitimate load demands upon it. However, on holidays or idle days the portable station is not operated, and a double-throw knife switch permits the section being connected into the trunk feeder from the main haulageway.

For this service the breaker normally feeding the panel load becomes invaluable in protecting against fires from high resistance grounds. Actually, if sufficient copper were added

between the panel load and the distant main haulage entry in these sections to reduce resistance and insure the breaker at the panel entrance tripping on fault currents, the cost of the feeder lines would greatly exceed the cost of the circuit breaker on the outbound side of the portable station. The amount of copper in use per ton of coal mined is given much consideration at New Orient, and every precaution taken to prevent building up ineffective and unwieldy feeder lines.

One of the safety features of sectionalizing greatly valued by the underground officials at New Orient lies in their ability to deenergize any section at any time, regardless of line or load conditions, without danger of injury from arcing. The line can only be broken first at the sectional breaker and never at some remote knife switch. In event of roof trouble and the trolley being down, repairs can be made quickly and safely in small areas without penalizing production elsewhere.

One of the great advantages of the sectionalized New Orient power network lies in the improved continuity of substation service. Only at very rare intervals are the generator breakers subject to outages, so well are line troubles along the main haulageways and in the panel sections blocked from extending beyond the limited areas of their origin. There is also a freedom from substation maintenance troubles of all kinds, which can be secured in no other manner. Sections here and there are off the line for short intervals but the results are comparatively negligible as regards the daily tonnage quota. Any generating equipment performs most reliably when not subject to frequent interference to continued operation.



Full-automatic switchboard in one of the substations. The Type KSA circuit breaker panel on the left feeds into the main entry distribution system

Work on "Treasure Mountain" For S. F. Fair Begun

With the completion of the "Hall of the Mineral Empire," for the 1939 Golden Gate International Exposition at San Francisco, construction will start at once on "Treasure Mountain," a replica of a vast mountain range which will present a complete picture of various types of mining activity in actual operation.

According to final revised plans, visitors will enter the building from the outside through a passageway resembling the tunnel of a mine. Coming out through the entrance to the bore, the spectator will find himself in a valley between two towering mountain ranges in a typical mining region. From the floor of this valley the illusion of distant peaks 30 to 40 miles away will be created by forced perspective and the varying use of color and lighting. Far in the background Mt. Shasta will be seen. Actually these peaks will rise 50 ft. from the floor.

From the valley floor several different mining districts will be in view. On one side the open cut copper mines of Utah, Arizona and Nevada will be reproduced. On the opposite side will be a replica of a section of the Mother Lode country. Deep lode shafts, dredges, hydraulic equipment and mills will be shown in operation.

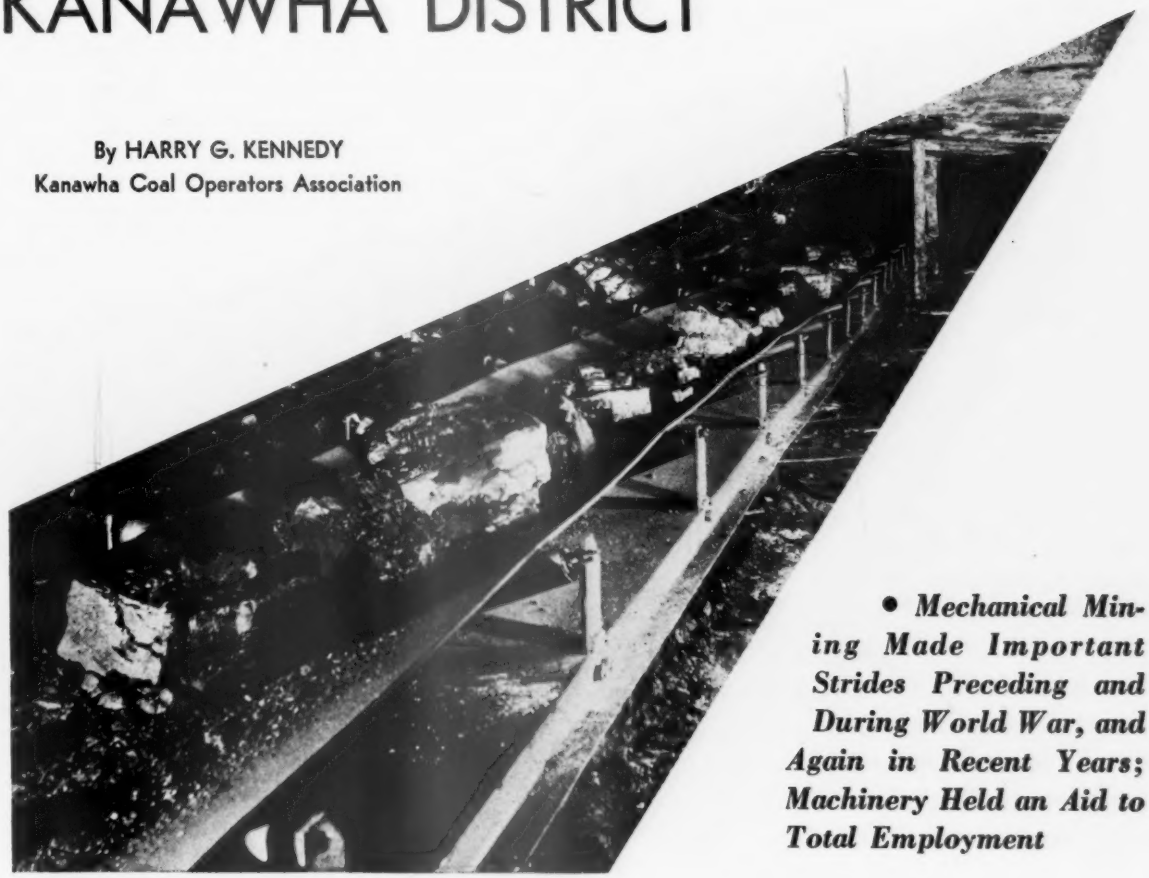
In another section the Mesabi range, coal mines, chemical beds and other important mineral deposits will be depicted. One of the features of the valley will be a full-sized reproduction of the old assay office at Ophir, Calif., the first mint to be established in the gold country. In this stone building on the floor of the exhibit palace will be the executive offices of Mining Exhibits, Inc., the non-profit organization in charge of the mining industry's displays at the Exposition.

Passing into another tunnel in the side of the mountain range, the visitor will have the opportunity to inspect mining operations close at hand. From a ramp the spectator will be able to look down on a three-compartment shaft station and view cars and hoists in operation. Continuing on through the tunnel, the visitor will see replicas of typical ore bodies of some of the world's most famous mines. A cross section of the Butte district will show the vein formation, tunnel structure and shafts. A little farther along a reproduction of the Park City mother lode will be reproduced. Miners operating drills and mucking machines, trucks, cars and hoists handling the ore, ventilator fans, water seeping slowly through the tunnel roof and many other realistic features will complete the illusion.

Harry E. Bush is in charge of the Exposition's Division of Mines and Metals.

HISTORY of the KANAWHA DISTRICT

By HARRY G. KENNEDY
Kanawha Coal Operators Association



Moving coal on a mother conveyor in the Kanawha district. Seam varies from 28 to 36 inches

• Mechanical Mining Made Important Strides Preceding and During World War, and Again in Recent Years; Machinery Held an Aid to Total Employment

HISTORY of coal mining in West Virginia dates back almost 200 years to the discovery of coal by John Peter Sallings in 1742 on Coal River, a stream traversing what is now known as the Kanawha District.

In the year 1800 Phillip Null discovered the now famous Pittsburgh coal seam at Pocatalico River, in what is now known as Putnam County. The first record of development occurred in 1817 when John P. Turner, a New Yorker, opened a mine and started supplying coal to the salt furnaces in the Kanawha Salines near Charleston, the most productive salt region at that time in America. In 1818 an estimate made by a Cincinnati merchant showed that 116,000 bushels of coal were used that year between the mouth of the Kanawha and the Falls of the Ohio.

Salt Industry Aided Early Expansion

In 1836 Professor William Barton Rogers was sent by Virginia over the Alleghenies to explore the coal seams of what is now West Virginia. He traced the "Upper Coal Series" from Pittsburgh south to Clarksburg, thence across the Little and Great Kanawha Rivers and as far south as the Big Sandy River. In his report of 1840 he stated there were 90 salt furnaces along the Kanawha River which made 1,000,000 bushels of salt annually and consumed 5,000,000 bushels or 200,000 tons of coal. The total West Virginia production for that year was 298,694 tons of 28 bushels each. Nine hundred and ninety-five miners and

HARRY G. KENNEDY

workmen were employed and the capital invested was $1,301,855. In 1841 he examined five bituminous and two cannel seams, all above the water levels of the Great Kanawha Valley. His work was discontinued in 1843 when the Virginia Assembly abolished the Geological Survey of the state.

In 1865 the Averill Coal Company began operations at the mouth of Pocatalico River, and in the following year the Peytona Cannel Coal Company started to mine at Peyton on Coal River. By 1875 nine mines in the Kanawha field were producing 310,000 tons of coal, of which 101,000 tons were burned at the salt furnaces and 200,000 tons were shipped in barges down the river.

Railroad Developments

On January 29, 1873, the New River bridge of the Chesapeake & Ohio was completed, making a through route between Clifton Forge, Va., and Cincinnati Ohio. Then followed the railroad developments which were completed in the order shown in the accompanying table.

Railroad	*Branch*	*Completed*
Winifrede	Lewiston to Winifrede	1883-1884
Kelley's Creek	Cedar Grove to Mammoth	1890
Chesapeake & Ohio	Cabin Creek	1892
Kanawha & Michigan	Corning, Ohio, to Gauley Bridge	1894
Campbell's Creek	Dana to Putney	1902
Kelley's Creek Northwestern	Cedar Grove to Mammoth	1904
Chesapeake & Ohio	Powellton	1905
Chesapeake & Ohio	Paint Creek	1905
Chesapeake & Ohio	Coal River	1905
Kanawha & West Virginia	Charleston to Blakely	1907

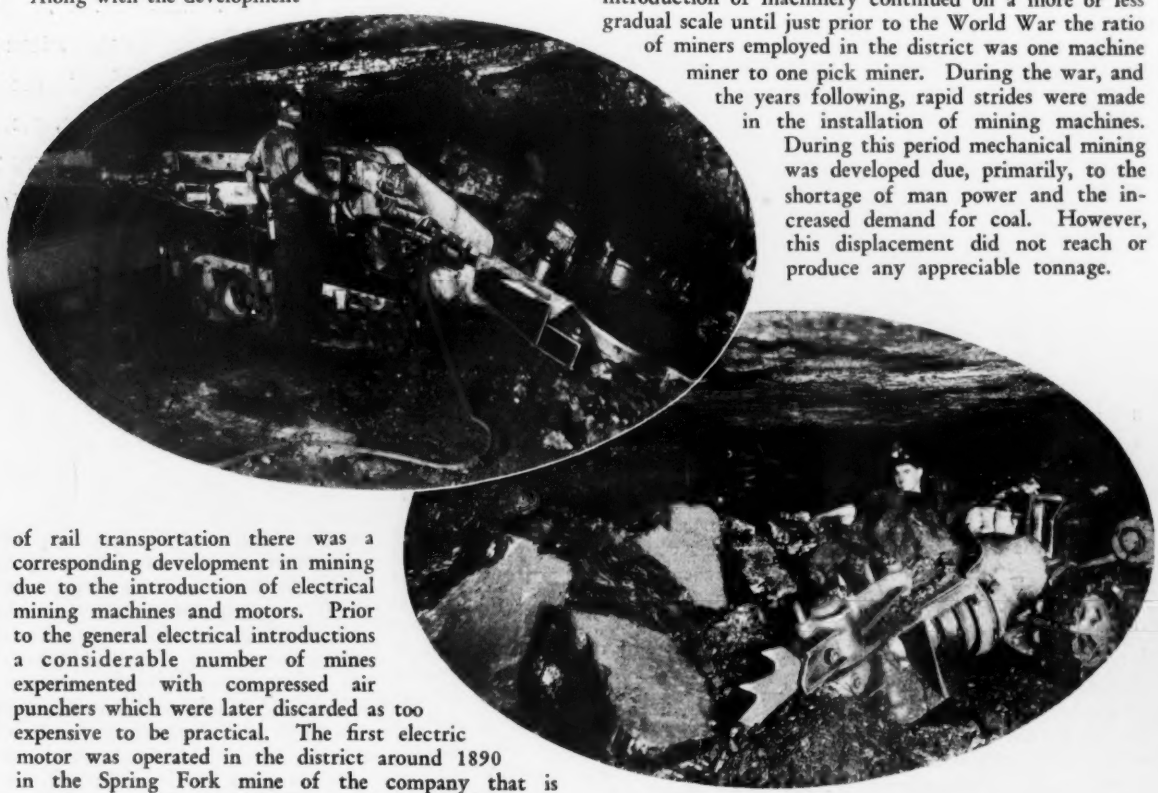
Electric Motors Introduced in 1890

Along with the development of rail transportation there was a corresponding development in mining due to the introduction of electrical mining machines and motors. Prior to the general electrical introductions a considerable number of mines experimented with compressed air punchers which were later discarded as too expensive to be practical. The first electric motor was operated in the district around 1890 in the Spring Fork mine of the company that is now known as the Hatfield Campbell's Creek Coal Company. A few years later the first electric cutting machine was operated on Kelley's Creek by the company that is now known as the Kelley's Creek Colliery Company.

In 1897, when earliest records of this type became available, there were 55 mining machines being operated by 16 companies within the state, 21 of these machines being operated by 7 companies located in the Kanawha district. During the next few years the introduction of machines and motors was rather rapid. At the turn of the century there were 105 mining machines in the Kanawha district producing 871,642 tons of machine coal.

World War Spurred Mechanization

Of the 3,773 miners employed in the district at that time 859 were machine miners and 2,914 pick miners or a ratio of one machine miner to three pick miners. The introduction of machinery continued on a more or less gradual scale until just prior to the World War the ratio of miners employed in the district was one machine miner to one pick miner. During the war, and the years following, rapid strides were made in the installation of mining machines. During this period mechanical mining was developed due, primarily, to the shortage of man power and the increased demand for coal. However, this displacement did not reach or produce any appreciable tonnage.



Trend toward use of mobile loaders has risen in recent years. Upper—Loading in 7-foot seam with middle parting of heavy slate. Lower—Loading mechanically in 34-inch seam

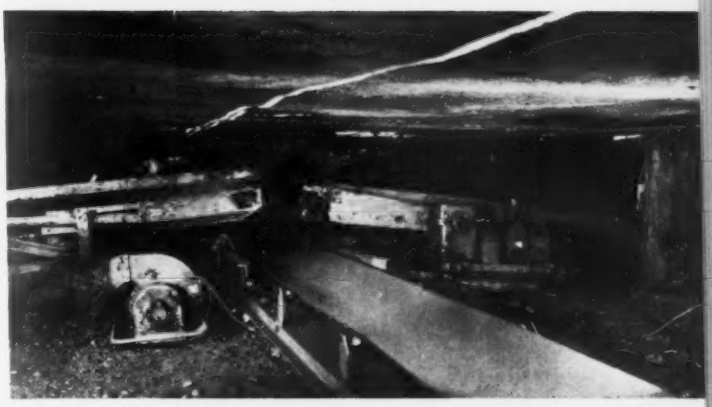
Following the war period and the slacking demand for coal, mechanical loading equipment was discarded for various reasons and the district continued to hand load machine cut coal; and today the ratio of miners employed is 20 machine miners to 1 pick miner, or to 1 miner employed on mechanized mining. In the past few years mechanized mining has again made its appearance in the coal industry and to a limited extent, as shown by the above ratio, in the Kanawha district.

Coal being mined commercially at present within the district comes from 12 seams, varying from 28 in. to 14 ft. in thickness. These comprise the Alma, Belmont, No. 5 Block, Cedar Grove, Chilton, Coalburg, Eagle, No. 2 Gas or Campbell's Creek, Hernshaw, Pittsburgh No. 8, Powellton, and Winifrede or Dorothy or Black Band Seams.

Employment Aided by Machines

The introduction of mechanized mining both as to mobile loading and hand loading on conveyors has not resulted in the displacement of labor in this district; on the contrary, it has put more men to work. In a majority of cases mines in this district that are now using the mechanical methods of mining are properties or sections of properties that could not operate economically under the hand loading system. Some of these mechanical installations were made in operating mines while others were made in either old properties that have been shut down for a number of years or in new developments. So by the opening of these new mines or the continuation of operation in the territory of unminable hand loaded coal, mechanized mining in the Kanawha district has provided work for many miners who would otherwise have found it difficult to obtain employment, and by so doing is entitled to hearty commendation.

History does not stop at any predetermined point. This leaves the prospect of future methods of mining which may come into prominence in a state of uncertainty.

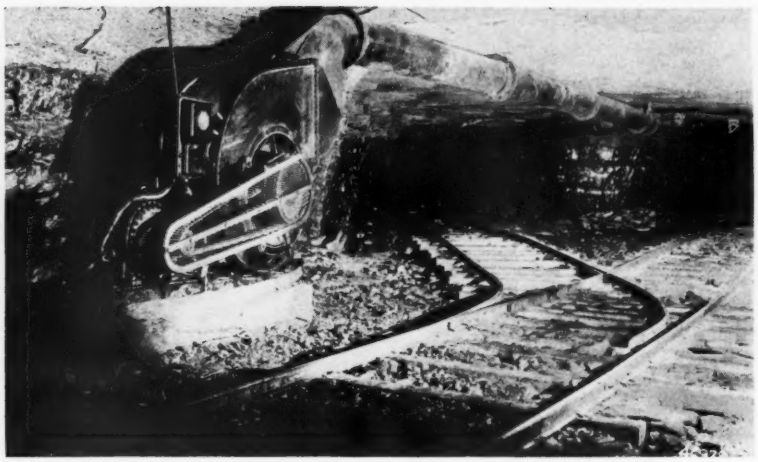


Two room conveyors discharging on to mother conveyor in seam varying from 28 to 36 inches

Above—Hand loading coal on to face and room conveyors in a 32-inch seam

Below—Loading point in conveyor-equipped property in 30-inch seam

Typical mining community in Kanawha district



Blower fans installed inside the mine are often needed for special ventilation requirements. This fan ventilates five parallel entries through Armco spiral-welded pipe

Practical MINE VENTILATION

• ***Quality, Though Usually Bettered by Stepping Up Quantity, Should Receive More Careful Consideration***

By H. G. HOUTZ
Special Inspector
W. Va. Department of Mines

MEASURES taken to protect the health and safety of inside employes would be incomplete without proper means of ventilation. Numerous articles have been written on this subject, and at times it may appear that too great an emphasis is placed upon this individual phase of mining. The experiences of mine inspection departments, however, discloses numerous instances in which this essential feature of mining has been greatly neglected.

The purpose of mine ventilation is to provide a sufficient quantity of pure air adequately to protect the health and safeguard the lives of all inside employes.

Three Fundamental Requirements

Mine ventilation is not adequate unless it provides complete protection against three different types of atmospheres:

(1) Atmosphere deficient in oxygen, (2) atmosphere containing poisonous or toxic gases, and (3) atmosphere containing explosive mixtures.

Man requires a continuous supply of oxygen for his existence. This fundamental requirement has received scant consideration in the ventilation practices of many mines. For many years it has been the habit of many mining men to regard ventilation primarily as the means of diluting, rendering harmless and carrying away dangerous or toxic gases, and to give it but little consideration in mines which did not liberate such gases.

When exposed to mine conditions air loses its oxygen by chemical combination with other elements and through absorption by the coal, and unless replaced, the oxygen content falls below that normally required for human consumption.

Ordinarily oxygen deficiencies are not detected until they become low enough to affect the flame of a safety lamp, and in mines in which the use of a flame safety lamp is not routine, great deficiencies may exist without detection.

Oxygen Deficiencies Not Uncommon

Discomfort which may result from prolonged exposure to small deficiencies of oxygen is seldom considered to be due to an abnormal working condition. Oxygen deficiencies have been

"Keep the white lights burning," admonishes the Safety Bulletin Board. Proper mine ventilation is a most important factor in mine safety

found in mines and in sections of mines which have been regarded as being well ventilated. Some operating mines have had less than 16 percent oxygen at the working face. In at least one instance noted, a flame safety lamp would not burn when within 200 feet of the working face, and pipes or cigarettes could not be lighted within 500 feet of the face.

The human body has the faculty of adapting itself to abnormal conditions to a remarkable degree without any apparent injurious results. A deficiency of oxygen, particularly when accompanied by an increase in carbon dioxide, is usually accompanied by an increase in lung ventilation, to compensate for the deficiency. This throws an added strain upon the heart and lungs, particularly when the person is active, and undoubtedly consumes some of the energy which otherwise would be expended in work.

The immediate discomfort and fatigue which accompanies such exertion is not always recognized as being due to a depleted atmosphere. Workmen who are regularly subjected to such atmospheres come to accept them as being normal and do not regard them as being injurious. Any permanent physiological effect is usually due to the continued exposure to such conditions over a period of years, and it is interesting to speculate to what extent the high rate of pulmonary ailments among the older miners are directly due to oxygen deficiencies.

Air Stagnation the Usual Cause

Oxygen deficiency is the usual result of a stagnation of air. In many mines such stagnation is accompanied by increased temperatures and increased humidity. For some time it has been fully recognized that such atmospheric conditions contribute more to the immediate discomfort of a person than the impure air which may be present.

Discomfort has been noted at temperatures of about 79° F. with moderate humidity, and as low as 70° F. with high humidity. This discomfort increases as temperatures approach body temperature, and is further intensified by an increase in the humidity.

The welfare of the workers requires conditions by which the heat from their bodies can be dissipated. Unless this can be accomplished they suffer greatly from fatigue, and their ability to work is limited. Provided the temperature does not become too great the continual movement of air caused by effective ventilation greatly facilitates the loss of body heat, and materially increases their capacity to work.

Extensive investigation of atmospheric conditions and their relationship to body tolerance has been made by the American Society of Heating and Ventilating Engineers in cooperation with the U. S. Bureau of Mines and the U. S. Public Health Service. Experiments conducted in still air indicated that the upper limit of man's ability to compensate for atmospheric conditions was about 90° F. saturated. Under similar conditions, this limit was increased to about 95° with an air velocity of 200 ft. per minute.

After air has reached body temperatures, air velocity resulted in an increase of body temperatures, and was no longer effective in affording relief.

In many mines the use of gasoline and steam locomotives presented a definite hazard until their replacement by modern haulage equipment

Little Attention Given to Economic Effects

The economic effects of poor atmospheric conditions are frequently disregarded. Unless the resultant discomfort becomes too severe, both employes and management accept them as being normal for the mine. Observations have shown that workers exposed to such conditions become listless and indifferent; they tire easily, and their capacity for work is limited. Comparisons of efficiency between mines known to have poor ventilation and others of the same type with adequate ventilation prove the well-ventilated mines to have an increased production per man-day.

The establishment of adequate ventilation in a previously poorly ventilated section has generally been followed by an increased efficiency and the realization of unsuspected economies. Workers previously requiring assistance have been found to do their work unassisted; cars are loaded heavier, absenteeism from incapacitation is reduced and similar economies have resulted in decreased costs.

Toxic Gases Often Accompany Oxygen Deficiencies

Regardless of any detrimental effect to which the worker may be subjected from a deficiency of oxygen or from stagnation, such atmosphere presents a definite hazard in mines, as they are more than likely to contain poisonous or toxic gases. Such gases are liberated by blasting, and they may be formed by natural conditions existing in many mines. In confined areas such gases are dissipated slowly, and workers are subjected to their injurious effects for long periods.

The presence of such poisonous or toxic gases is not readily detected and is frequently unsuspected until the effects become too severe to be further ignored. Physical discomfort such as headaches, lassitude and the like are usually attributed to some physical ailment, and in some instances the worker acquires a degree of immunity which enables him to withstand exposure with but slight discomfort.

Small percentages of carbon monoxide gas are encountered frequently in some mines, and workers have been subjected to this gas without realizing the injurious effects upon them. Instances have been noted where the blood of the workers has been found to have a saturation of 30 percent.

In other mines a concentration of 0.10 to 0.15 percent of carbon monoxide gas has been found to be present for a considerable time after shooting, and under such circumstances workers have been overcome and had to be revived with artificial respiration.

Hydrogen sulphide is seldom encountered in mines from natural liberation in quantities sufficient to be dangerous. In one instance, however, natural feeders were encountered which liberated this gas in dangerous quantities. A high percentage was being liberated from fissures in a clay seam, and after mixing with the air current as much as .04 percent was found at the faces.

When any of these conditions exist the economies which can be accomplished by good ventilation can be easily visualized. Mines have been found where the working places were so deficient in ventilation that the miners had to resort to the practice of shooting one day and loading the next. While such an extreme case is not common there are many mines where from 30 minutes to one hour and 30 minutes are lost by the loader after each shot. The stopping of such losses will undoubtedly decrease production costs.

A relic of the past. Such furnaces, formerly used to ventilate mines, have now been replaced by modern fans to insure safe and adequate ventilation

Dangers of Explosive Mixtures

The hazards from accumulations of explosive mixtures are known to all mining men but frequently the proper care is not exercised to prevent their accumulation. Before the advent of modern ventilation, deficiencies of oxygen undoubtedly prevented many explosions.

In recent years the increasing use of rock dust has prevented the propagation of many explosions and has kept the fatality rate down. Gas explosions are not the result of chance. In every instance in which they occur they are due to some neglect of the ventilation system. Unfortunately we have not yet reached the point where an explosion of gas within the mines is an impossibility.

In order to protect the health and to safeguard the lives of all inside employes it is essential that a continuous and adequate current of air is delivered to all parts of the mine. To provide the proper protection it is essential that the oxygen content of air should remain high and that air with even a small loss of oxygen should be replaced, and that an adequate volume of air—not less than about 6,000 cu. ft. per minute—be delivered continuously to within a reasonable distance of the working face.

In practice we are dealing with unseen dangers from unseen mediums, and in our attempt to neutralize these dangers we use an unseen agent. There is little wonder that in mines which have been immune from accidents from these sources there is a general relaxing of the vigilance necessary to detect them.

Most managements are ventilation conscious, but frequently it is their belief that when adequate ventilating has been provided they have fulfilled all their responsibilities. In such cases there is little or no planning for present or future ventilation. Projections for development are made with but little thought to the requirements of ventilation. Sufficient airways are not provided, and those in use are permitted to become blocked. The coursing of air to the faces and the constant changes of the ventilating current required as the mine develops is left largely to chance, and often is in charge of an individual who is not properly qualified.

Frequently doors are improperly installed, and through mistaken ideas of economy stoppings are often improperly constructed, thus contributing greatly to the general inefficiency of the ventilating system.

Rigid Attention to Doors Imperative

It is impractical if not impossible to eliminate the use of doors in venti-

lating a mine. A too frequent splitting of the air would result in too small a volume for each split. The danger from doors, however, can not be too greatly stressed. In the great majority of cases where an explosion has occurred, the accumulation of gas has been caused by a door which has been broken or left open. The practical solution of this hazard is to prohibit single doors and to provide sufficient air courses to enable the haulage road to be adequately air-locked at all times. The enforcement of these provisions will assure a continuous ventilating current and will do much to minimize the possibilities of explosions.

Eliminate Leaky Stoppings

Effective ventilation cannot be secured with leaky stoppings. The usual practice at most mines is to ignore the accumulative effects of leaks. If a stopping at the beginning of a split had a hole in it large enough for a man to crawl through, the management would be properly censured for allowing such a condition to exist, but when a series of smaller holes are in existence, the total loss from which equals the aforesaid hole, they are usually ignored.

When the ventilation at the faces becomes so poor that it can be no longer disregarded, the tendency is to obtain more air by speeding up the fan or by obtaining one of larger capacity. Such measures are extremely inefficient. If the primary difficulty is from leaky stoppings, an increase in ventilating pressure only results in the loss of a greater percentage of air and a further reduction in ventilating efficiency.

There are innumerable instances throughout the mines where leaky stoppings are responsible for most of the ventilation troubles.

In most instances the cost of making the necessary repairs to insure proper ventilation is not excessive if carried out in a systematic manner, but frequently such repairs are neglected until large amounts of money must be expended to rehabilitate the ventilating system.

The expectant life of a stopping should be carefully considered before it is erected, and the material should be properly selected and installed to eliminate leaks as much as possible. It is evident to every thinking man that if it is necessary to provide four times as much air at the fan than is actually needed to ventilate the mine that the additional power cost would be more than ample to provide for installation of proper stoppings to prevent such leakage. Cases of this kind are not uncommon. In such instances it is not possible to calculate the actual power saving which could be made if the mine could be ventilated with only that which would be required, as the ventilating pressures are known.

However, it is conservatively estimated that in some instances the power actually used is about 20 times that theoretically required to circulate only the necessary air.

Of course, it would be impossible to have 100 percent of the air delivered to the working faces of any mine, but leaky stoppings cost the mining industry enormous amounts of money each year.

High standards for ventilation have been proven to result in higher operating efficiency as well as affording greater protection for the workers.

In ventilation investigations, poor ventilation has been encountered in the most unsuspected places. Careful and continuous vigilance is required to avoid inadequately ventilated areas in the best ventilated mines. It is necessary that a close check be made to be certain that such conditions do not exist.

Establishment of Adequate Standards Urged

A policy should generally be adopted requiring a definite amount of air at all times at or near the working faces. To secure good ventilation it is necessary to establish a standard based on the practical requirements of the worker. Should such a policy be adopted, some mines now regarded as being well ventilated would not meet the requirements, and it is anticipated that it would take some time before all mines could be considered as complying with the standard. However, such a program should be pressed with full assurance that the ultimate objective would result in better health and greater security for the vast body of men who supply the fuel requirements of the nation.

American Zinc Activities in Washington

Since American Zinc, Lead and Smelting Company entered the state of Washington more than four years ago, it has pursued a steady policy of acquiring and developing zinc and lead holdings which have put it in a position to become a highly successful and profitable producer in a district far remote from its previous operations. It first acquired a controlling option in the extensive acreage held by Metaline Mining & Leasing Company on the west side of the Pend Oreille River just above Metaline Falls, Wash. It then secured an option on the holdings of the Grandview Mines Company on the east side of the river just below the town. Its holdings have been expanded to include additional mineralized ground and also a site for a 1,000-ton mill across the river from its mile-long tunnel in Metaline Mining & Leasing property. Announcement of plans for a new mill is not expected until higher prices for zinc and lead seem assured.

This company has put the Grandview mill, of accredited 300-ton capacity, into full operation, and expects to enlarge it to some extent. The mill is now used entirely for the treatment of ore from Metaline Mining & Leasing Company's ground. The ore comes chiefly from development which is being done in a thorough manner and which is opening large stopes of zinc-lead ore. Included in this development are several crosscuts, drifts and raises. One of these raises reaches a winze from an old tunnel 500 feet above the lower workings. This is important not only because of the ore developed, but also for the ventilation it affords.

This company brought its shipments of concentrates up to 25 carloads in January and probably handled a heavier tonnage in February.

Illinois Mining Institute Boat Trip

The twentieth annual boat trip and summer meeting of the Illinois Mining Institute will be held June 10-12, 1938, aboard the S.S. *Golden Eagle*, leaving St. Louis on June 10 and returning on June 12, according to a recent announcement by B. E. Schonthal, Secretary-Treasurer of the Institute. Further details concerning the program will be announced at a later date.

COAL DIVISION Reports

of the AMERICAN MINING CONGRESS

CONVEYOR MINING SYSTEM

THIS mine is located in the northern part of the Hocking Valley district of Southeastern Ohio in the Middle Kittanning or No. 6 seam. The seam in this part of the district is normally about 5 ft. in height, the top portion being unmarketable coal. The seam dips slightly to the Southeast but has numerous local grades running from 2 to 5 percent.

Where conveyors are used, only the bottom portion of the seam is mined, and the bone coal becomes the roof. This gives a height of approximately 36 to 39 inches in most cases, and each cut yields about 30 tons. The bone coal is uniform and hard, and forms an excellent top. The coal drills easily and mines fairly small but uniform. The seam is free of local faults, and working conditions are quite uniform where conveyors are used.

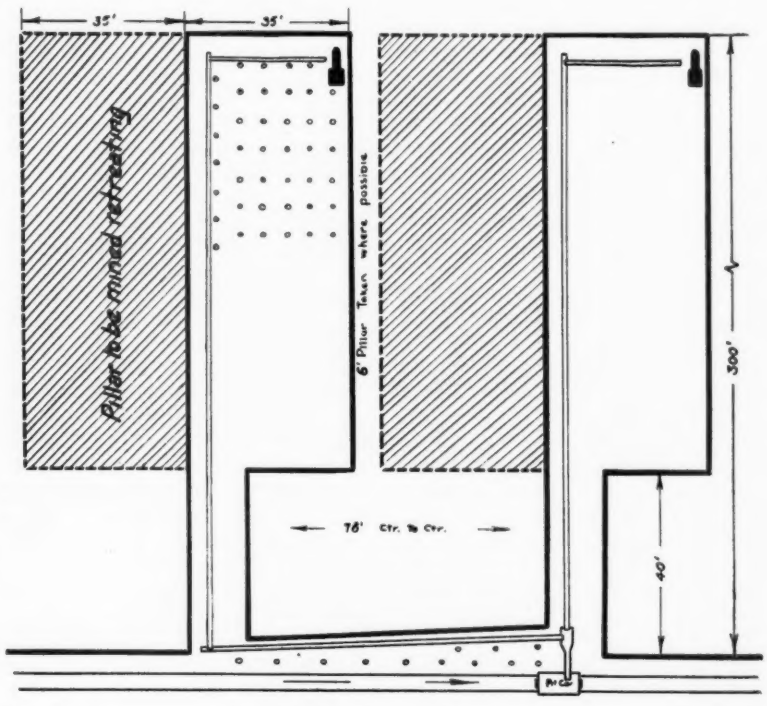
Equipment

At the present time a conveyor unit consists of two 300-ft. chain and flight room conveyors, two 25-ft. face conveyors with sufficient extra sections to lengthen them to 35 ft., one 80-ft. cross conveyor and one elevating conveyor. Shortwall machines making a 6-ft. undercut are used. Drilling is done with small electric coal drills. Mine cars used have a capacity of approximately 1.5 tons and are switched in above the conveyor through a crossover and handled under the loading conveyor by means of a 5-hp. room hoist.

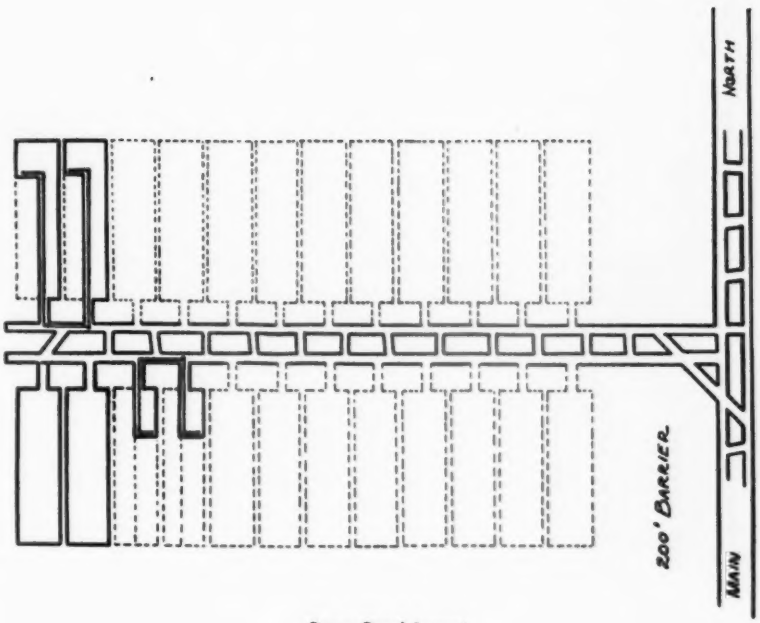
The coal is shot by means of electric blasting caps and pellet powder. Approximately 4.5 sticks of powder are used for each cut. Five holes are drilled.

Mining System

As shown on the attached sketch, the panel is projected to be mined retreating with two conveyor batteries of two rooms each, one working to the right and the other to the left off the butt entries. Up to the present time, however, mining has been limited to working only one side at a time. The two rooms in a battery are advanced abreast, and both pillars are mined out simultaneously. Rooms are driven on 76-ft. centers. Necks are driven in by hand, approximately 12-ft wide to a depth sufficient to leave a 40-ft. pillar between the room and the entry. From there on the work is taken up by the conveyor, and the rooms are widened out to 35 ft. After the room is driven in 300 ft., the face conveyor is lengthened to 35 ft. and the pillar drawn back open ended to within 40 ft. of the entry. This pillar is generally 35 ft. wide, but where practi-



Details of Room Mining



Room Panel Layout

cable all of the pillar is removed, in which case it is approximately 41 ft. wide. One row of posts on 5-ft. centers is set for each cut on both the advance and the retreat.

While the cover is fairly heavy, practically one whole panel has been mined out without experiencing any difficulty in maintaining the open end work. During slack periods there have been times when the conveyors have been idle as long as nine days. Despite the fact that idle time occurred while the pillars were being brought back, no difficulty whatsoever was experienced.

As shown on the attached sketch, the panel is laid out for mining on the retreat, all development work being done by hand. Each set-up is worked out in approximately 25 days double shift, or 50 shifts.

Since no pillars are drawn in regular hand loading sections, the above system allows the recovery of approximately 29.5 per cent more coal.

Submitted, January 1938, by the District Committee of Ohio.

Report of the MEETING of the MECHANICAL LOADING COMMITTEE

A MEETING of the Mechanical Loading Committee of the Coal Division of the American Mining Congress was held at the William Penn Hotel, Pittsburgh, on February 28, 1938. Newell G. Alford, chairman, presided at the meeting and the following committee members were present:

Newell G. Alford, Eavenson, Alford & Auchmuty (Chairman); R. C. Beerbower (Alt., L. F. Crawford), Goodman Manufacturing Co.; W. R. Cuthbert, Pittsburgh Coal Company; Edwin Johnson, Jeffrey Manufacturing Company; E. W. Potter (Alt., F. S. Follansbee), Koppers Coal Co.; C. W. Whaley, Myers-Whaley Company; J. W. Woomer, Hanna Coal Company; G. B. Southward, American Mining Congress.

The purpose of the meeting was to begin the study on Standard Forms for Operating Records of Mobile Loading Machines. The first meeting of the committee held on December 20, 1937, recommended that this study should be based on forms now in use by representative companies in the United States, and during the latter part of December the Washington office of the American Mining Congress made a request to a number of companies for sample copies of their forms. About 20 companies responded with daily reports for section foremen, shot-firers and machine inspectors, summaries of the daily reports, time study forms and daily and monthly cost sheets.

These sample forms were discussed by the committee. The wide variance in the reports and the items covered were taken as an indication that there was a need for developing a greater uniformity in record keeping, and it was also the expression of a number of companies who had submitted sample copies of their forms that the adoption of uniform reports would benefit the industry by making it possible to compare the efficiencies and the advantages of different operating methods.

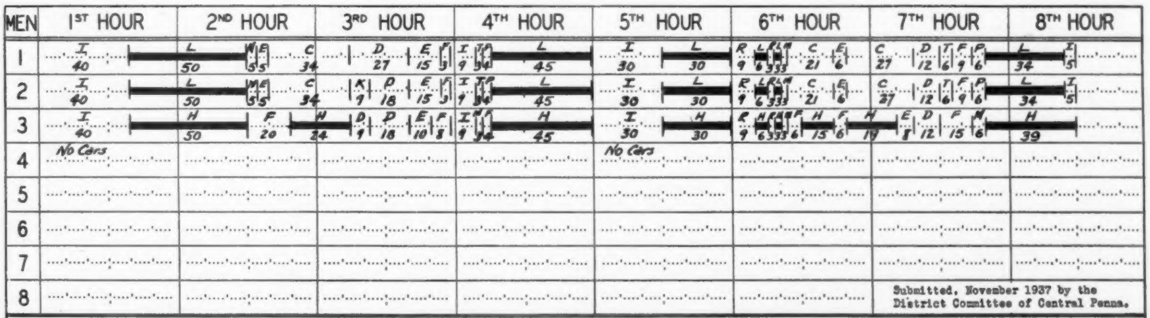
Considerable discussion was given by the committee to deciding what items of labor should be taken to make up a mechanical loading unit, or in other words, what point should be considered as the completion of the operation of the mobile unit crew and the beginning of the general mine operation. This decision is complicated by the different methods now in use, as for example, (a) the number of loading machines working together as one unit in a panel, (b) the number of locomotives serving one loading machine, (c) the method of hauling between the machine and the main line. It was the general recommendation of the committee that the loading machine reports, made daily by the face or section foremen, should include all work customarily performed by the unit crews, such as cutting, drilling, shooting, timbering, track laying, loading, placing cars at the machine and shifting them to the side track beyond the room switch where trips are delivered by another locomotive.

It was further recommended by the committee that standard nomenclature should be adopted. The locomotive placing cars under the loading ma-

(*Concluded on page 55*)

Conveyor Time Studies

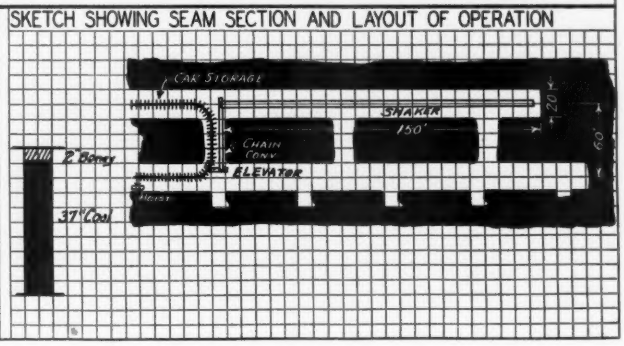
Entry Development



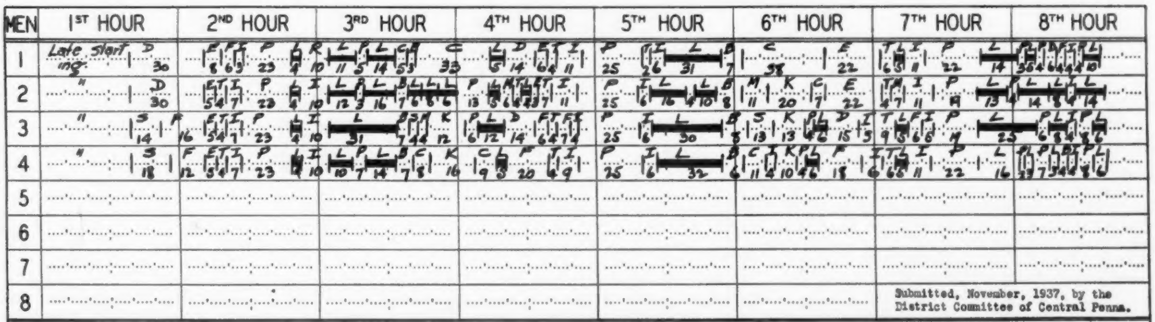
SUMMARY OF TIME STUDY			
KEY TO CHART		MAN MINUTES	PERCENT
C	CUTTING	164	12.15
K	CLEANING KERF	9	0.67
D	DRILLING	108	8.00
F	TAMPING-FIRING	77	5.71
T	TIMBERING	18	1.33
B	BRUSHING-TOP, BOTTOM		
P	PICKING IMPURITIES	20	1.48
L	LOADING AT FACE	336	24.88
H	CAR TRIMMING	232	17.19
S	HANDLING SUPPLIES		
E	EXTENDING CONVEYORS	70	5.18
R	REPAIRS	36	2.68
M	MISCELLANEOUS	28	2.07
I	IDLE	252	18.66
	TOTAL	1350	100.00

GENERAL NOTES ON OPERATION	
TONS PRODUCED DURING TIME STUDY	42.75 – 19 Cars
TYPE CUTTING MACHINE	Shortwall
DEPTH CUT	9' ~~GOBBED OR~~ LOADED
TYPE DRILL	Electric
NO. HOLES	6 — TYPE EXPLOSIVE Perm.
NO. TIMBERS	6
THICKNESS	GOBBED OR LOADED
THICKNESS OF IMPURITIES	2" – Gobbed
NUMBER OF CLEAN-UPS	2
TYPE HOIST	Electric
TYPE CONVEYOR	Shaker — CAR CAPACITY 2.5 Tons
GENERAL REMARKS	

SKETCH SHOWING SEAM SECTION AND LAYOUT OF OPERATION



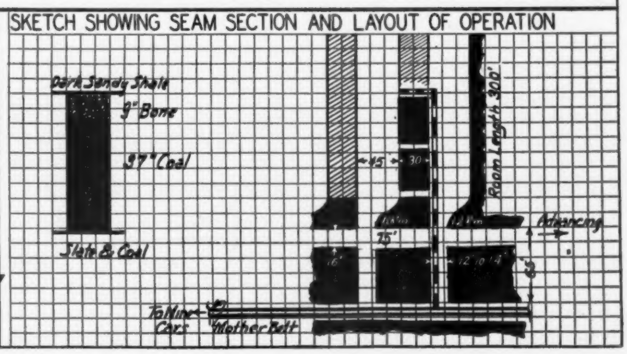
Room Mining and Pillar Recovery

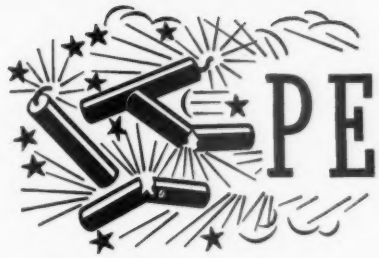


SUMMARY OF TIME STUDY			
KEY TO CHART		MAN MINUTES	PERCENT
C	CUTTING	111	6.5%
K	CLEANING KERF	71	4.2 "
D	DRILLING	109	6.4 "
F	TAMPING-FIRING	145	8.6 "
T	TIMBERING	62	3.7 "
B	BRUSHING-TOP, BOTTOM	57	3.4 "
P	PICKING IMPURITIES	326	19.2 "
L	LOADING AT FACE	466	27.5 "
H	CAR TRIMMING	—	—
S	HANDLING SUPPLIES	49	2.9 "
E	EXTENDING CONVEYORS	76	4.5 "
R	REPAIRS	10	0.6 "
M	MISCELLANEOUS	28	1.7 "
I	IDLE	182	10.8 "
	TOTAL	1692	100.0

GENERAL NOTES ON OPERATION	
TONS PRODUCED DURING TIME STUDY	60
TYPE CUTTING MACHINE	Bot. Cutter
DEPTH CUT	5½ ft. [redacted] LOADED
TYPE DRILL	Electric
NO. HOLES	13 — TYPE EXPLOSIVE Perm.
NO. TIMBERS	23
THICKNESS	9" top bone — GOBBED [redacted]
THICKNESS OF IMPURITIES	9" top bone
NUMBER OF CLEAN-UPS	3
TYPE HOIST	Electric
TYPE CONVEYOR	Chain Flight — CAR CAPACITY 1 ton 10 cwt.
GENERAL REMARKS	car trimmer at main belt loading point shares proportionately.

SKETCH SHOWING SEAM SECTION AND LAYOUT OF OPERATION





PERMISSIBLES

The anti-lynching filibuster succeeded not only in stopping the lynching bill but also in stopping the clock. . . . While to the rest of the world it was March 1, the Senate noted it as legislative day of January 5. . . . One nice thing about that . . . the depression wasn't so bad on January 5 as it turned out to be on March 1. . . .

■

Economically speaking, there's not much difference between the business situation today and in 1932 when Mr. Hoover was President except for one thing. . . . the public debt hadn't passed the $37,000,000,000 mark then. . . .

■

Statistics show a sharp increase in the number of lawyers. . . . That's easily explained. . . . The average man figures it's cheaper to raise his son to be a lawyer than it is to hire one to keep the head of the family informed on the multiplicity of laws under which he must live. . . .

■

The lighthearted abandon with which Congress discussed lip sticks and other cosmetics during consideration of the tax bill is refreshing to the chap who must pay the tax. . . .

■

Talking about the trend toward bigger books, you ought to look at the new farm act. . . . a Georgia Congressman read the first 60 pages and then called the Agriculture Department to get the author's assurance that the story has a happy ending. . . .

■

His friends staged a reception for Philippine Commissioner Paul McNutt recently at which he shook 400 hands. . . . What a trial for a man who has announced definitely that he is not a candidate for anything—right now. . . .

Things are bad, all right, but they can't be so awfully bad as long as we prefer the big apple to the goose step. . . .

■

One bad thing about this depression is that unless it ends pretty soon New Deal Congressmen will have to go back to kissing babies for votes in the next campaign. . . .

■

If the proponents of the train length limit bill were smart they'd line up as supporters all the motorists who have had to wait at grade crossings for a mile-long freight to pass. . . .

■

Treasury officials have complained that some people are hoarding $1,000 bills. . . . We can tell them right now that they needn't suspect us. . . .

■

The President wants to and may be able to raise prices. . . . But raising the money to pay the prices is still the people's problem. . . .

■

No wonder the Administration is doubtful if it can make the capitalistic system work. . . . Over here, the trouble is that everybody wants to be a capitalist. . . .

■

Chairman Jesse Jones has been ordered to push a program of Government loans to small business. . . . And only a few weeks ago Mr. Jones said that he wouldn't want to administer a law for lending money on character. . . .

■

"Believe It or Not Ripley" the other day pictured a pig that turned white from fright. . . . Could it have been caused by the enactment of the new farm bill? . . .

Chairman Doughton of the House Ways and Means Committee is on the job every morning at 7 a. m. . . . When you remember that the 330-page tax bill is a product of that committee you can see the reason a man has to be on the job that early. . . .

■

All these candidates for the Democratic nomination in 1940 remind us of what happens to peach blossoms when they come out too early. . . .

■

The President is giving consideration to the liquidation of the war debt of one of the smaller European countries. . . . It wouldn't be that the country wants to get cleared away so that it can borrow more in preparation for another war? . . .

■

The greatest need of the nation's young people, says a prominent official, is hope. . . . And all along, we thought that what young people need most is jobs. . . .

■

The most hopeful thing about the current business depression is that no one has yet called "general conditions fundamentally sound." . . .

■

For centuries mankind has tried to solve the mystery of where the elephant goes to die. . . . Now we know it's the polls. . . .

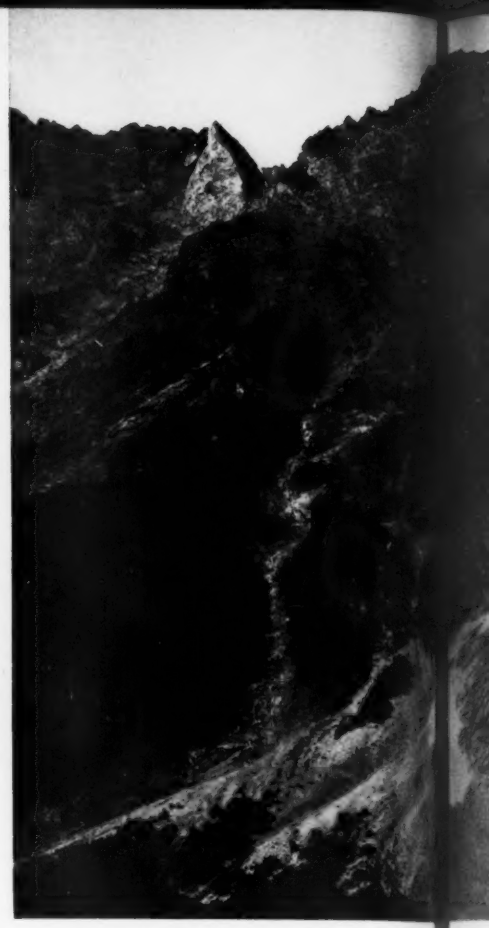
■

The President complains that the Senate is not a cooperative body. . . . That's a compliment that many Senators treasure. . . .

■

Publication of the President's off the record press conference remarks discloses one thing about the President. . . . He cracks an excellent joke. . . .

MINING ACTIVITY in WASHINGTON†



- ***Hindered by Rugged Topography and Heavy Timber Growth, Recent Development of Cascade Region Has Yielded Outstanding Operations***

By MILNOR ROBERTS

Dean of the College of Mines
University of Washington

THE mining areas of Washington can well be noted with reference to the topographic features of the State, which are highly varied. To begin our survey at the shore of the Pacific on the west and move eastward, every year a little gold is washed from certain beaches on the ocean coast extending south from Cape Flattery, the extreme northwestern point of the United States proper. The most interesting event of last year on the Olympic Peninsula, however, was the starting of drilling operations by the Sun Oil Company in the southwestern part of Clallam County near Forks, about 10 miles from the ocean and 25 miles south of the Strait of Juan de Fuca. The heavily forested foothills between the ocean and the Olympic Mountains contain numerous seeps of petroleum, which have led in the past quarter-century to the drilling of several wells in beds of marine sandstone and shale. Earlier wells drilled in this region found gas and showings of petroleum. At last reports the Sun well had passed 4,000 feet in depth and had struck some gas. The rig is adequate for a hole of much greater depth.

Production of manganese ore of good grade from a mine near Lake Crescent in the northern part of the Olympic Peninsula some 16 years ago has led to prospecting over many areas on the north, east, and south sides of the Olympic Mountains. Some of the surface showings appear to be important, but the ruggedness of the region and the lack of roads have delayed exploration of the deposits.

Coal Mines Yield Greatest Value

In the Puget Sound region the coal mines, which have been opened in several counties, made a notable increase in production during the past two years, a matter of considerable importance to the State, since coal is the most important mineral mined in Washington. Recently the use of automatic stokers in residences and larger buildings has greatly increased, owing to improvement in these devices and also to increase in the price of California fuel oil. The Northwest Experiment Station of the U. S. Bureau of Mines in cooperation with the College of Mines of the University of Washington is conducting an extended series of tests on the combustion of Washington coals in stokers of residential type. As the supply of fuel oil might be cut off from the Pacific Coast region in an emergency, the full possibilities of utilizing Washington coal should be determined more rapidly than the present allotment of funds permits.

Cascades Difficult of Access

Bounding the Puget Sound region on the east is the Cascade Range, which passes through the State of Washington in a fairly straight line from north to south. The higher portions of the range are mostly rugged and precipitous, and toward the north several glaciers occur close to the divide. The summit elevations vary from about 5,000 to 9,000 ft., although a few passes are lower and a few peaks higher than these figures. Rising out of the range are five volcanic peaks—Mt. Baker, near the Canadian boundary, Glacker Peak, Mt. Rainier (14 miles west of the Cascade Divide), Mt. Adams, and Mt. St. Helens.

Conditions for prospecting and mining in the Cascade Range are different from those in any other part of this country. The name of the range was derived from the innumerable streams that cascade down its slopes both eastward and westward. The western slope

† Presented to the Eleventh Annual Mining Institute, University of Washington, January 17, 1938.

Difficult accessibility of areas in the Cascades, typified by this general view near the Azurite mine, has been a marked deterrent to prospecting and development

bears probably the heaviest stand of timber of any mountains in the world, the conifers extending eastward over the summit but diminishing in size and density as they approach the foothills, where they give way to pine groves and grasslands.

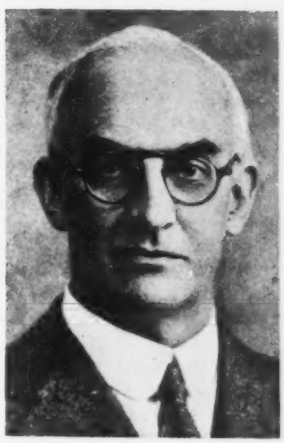
The rugged topography, rushing streams, glaciers, glacial drift, and dense vegetation made pioneer travel exceedingly arduous, with the result that prospecting here was long delayed. Even today, when most parts of the West are well known, the Cascades contain many areas so difficult of access that the prospecting in them has not been at all thorough. Other areas are so rugged that exploration of the discoveries has been slow.

Same Conditions Aid Operation

On the other hand, the very conditions that hinder the early stages of mining in the Cascades are highly favorable to operation. Usually when a mine is opened the logging of a few acres furnishes timber and lumber enough for the needs of early mining and construction. Water is present in abundance for power and milling. The steep, rocky slopes and deep gorges afford opportunities to explore a vein at depth by tunneling, without the necessity of sinking. At the higher altitudes many areas have been scoured clean by glaciers, resulting in exposure of fresh rock surfaces. Under such conditions no oxidized zone exists. Often the prospector finds sulphide minerals glistening at the actual surface.*

Gold From Whatcom County

In Whatcom County, just south of the international line, is the Boundary-Red Mountain mine, now called the International. For many years this was the steadiest gold producer in the State; recently it has made a smaller production, but has been making a thorough geological survey of its property. Little is heard of this mine, since it is approached from the Canadian side by a trail up Silesia Creek. Southward a few miles are other gold properties where work takes place each year; for one of these a mill is now being designed. In the southeastern part of Whatcom County on a tributary of Ruby Creek, which flows into Skagit River, is the Azurite, where heavy pyrrhotite ore is being milled and cyanided at the rate of about 100 tons per day. For last November the mill feed averaged about $18 per ton. The mine is owned by a Washington company but is being operated by the American Smelting and Refining Co., through the Federal Mining and Smelting Co. at Wallace, Idaho. Access to



MILNOR ROBERTS

* Similar notes on the Cascades appeared in the writer's article in Northwest Mining, Vol. 3, No. 22, Dec. 2, 1937.

Portal of 100 ft. Burnham drift on Azurite vein during early development

the mine is now had from the eastern side of the range via the Methow Valley. Just west of the Azurite is the Gold Hill, which is being explored this winter by two shifts of men. The construction of a road up from the Skagit River, for which the State has made an appropriation, will greatly improve the chances for operation. The New Light on Slate Creek, only four miles west of the summit and reached by a 40-mile road from Winthrop, has already tested its new 50-ton mill, and, according to S. S. Callahan, president of the company, will be operating in the spring of 1938.

In Skagit County, next south, the mining of limestone has been taking place for many years at Concrete, where the Superior Portland Cement Co. has a large cement plant. Farther up the Skagit River a business is being developed in the mining of soapstone. The hydro-electric developments on the upper Skagit by the city of Seattle have brought transportation closer to the several mineralized regions within the drainage area of the Skagit, notably Thunder Creek, where exploration has been taking place, and the Slate Creek region. An interesting occurrence of nickel-bearing sulphides is being tested in the foothills a few miles southeast of Mt. Vernon.

Near Glacier Peak in Snohomish County the M. A. Hanna Co. of Cleveland has been diamond drilling the property of the Glacier Peak Mining Co., owned in Roslyn. Both copper and molybdenum sulphides occur there in disseminated form. Near Index the Sunset mines, which for many years was the principal copper producer in the State, is again in production. In Sultan Basin, work has been taking place on several copper properties.

At Grotto, on the main line of the Great Northern Railway in King County, the Northwestern Portland Cement Co. is operating its limestone quarry and cement plant. On the headwaters of the Snoqualmie several prospects are being explored for base-metal ores. At Miller River the Apex is mining and treating its gold-arsenic ore with the aid of new flotation machines. Other properties in the district have recently been examined.

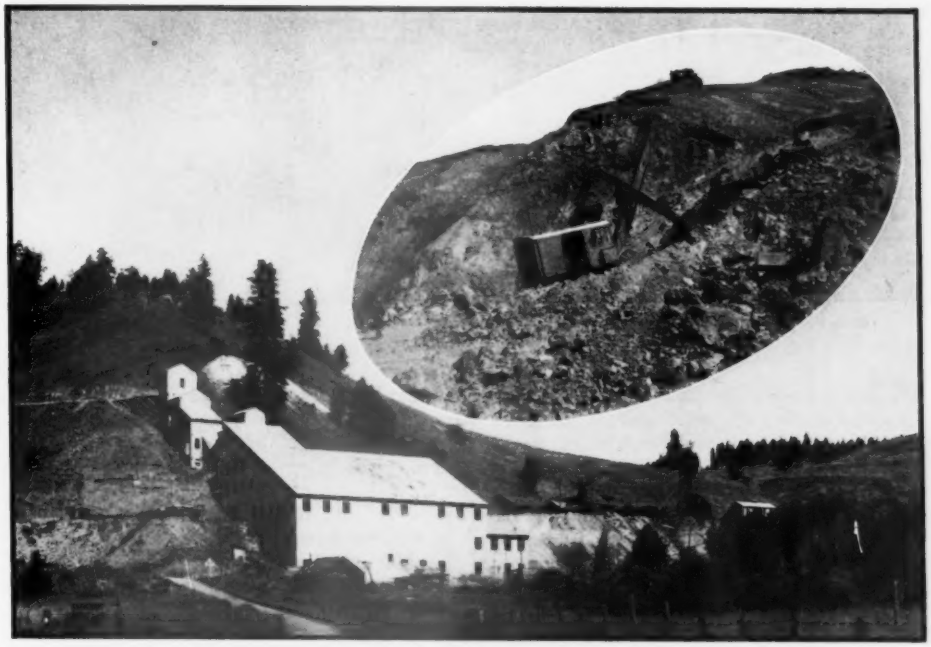
In eastern Lewis County the mercury mines at Morton are being worked in a small way. The anthracite beds in the Davis field at the head of the Cowlitz River have been under development for several years past and some shipments have been made by truck. The St. Helens mining district in Skamania County has been active, but transportation is costly. Some ore has been shipped for test treatment.

Old Mines Resuming in Eastern Cascades

On the eastern slope of the Cascade Range the most northerly county is Okanogan. In the small mountain ranges that rise gradually from the Okanogan River westward to the Cas-

Above—The new mill of the Chelan Division of the Howe Sound Co. is rapidly nearing completion

Right—Howe Sound Company's new dock at Lucerne, where concentrates will begin their journey to the Tacoma smelter



Mill and cyanide plant of Knob Hill Mines, Inc., Republic, Washington, completed in 1937. Capacity 400 tons daily. Insert—Loading ore at the Knob Hill mine

cade Divide are several areas that have been the scene of prospecting and mining for several decades. Some of these are reached from the Okanogan Valley and others via the Methow. The Arlington is mining and milling 20 to 30 tons of lead-zinc-copper ore and shipping the concentrate to the Tacoma smelter. The Chief Sunshine, near Conconully, is being further explored for tetrahedrite and galena ore, a shipment of which was made last spring. Other old mines in this region have attracted recent attention. In the Methow region the old Alder copper mine is being equipped with a mill this winter. At Mazama the Mazama Queen is ready to start a new 50-ton mill to treat its gold-silver-lead-zinc ore.

Howe Sound Development Outstanding

The Holden copper mine on Railroad Creek, which enters Lake Chelan near its head, is now nearing the production stage after development at intervals over a period of some 40 years. Situated in the heart of the Cascade Range and reached by boat on the lake and 12 miles of road up a glacial hanging valley, this mine represents the most important new development in the industry in the Pacific Northwest. The operation is conducted under the name of the Howe Sound Co., Chelan Division. Since this company took charge of the property 10 years ago it has explored the deposit by several thousand feet of drifts, crosscuts, and raises; also by extensive diamond drilling. The results obtained by the spring of 1937 warranted the company in planning to operate at the rate of 1,000 tons a day, or somewhat more.

Above—Mill and camp at the Germania tungsten mine, near Wellprinit, Washington, owned by General Electric Company

Right—Stoping in 18-in. vein at the Germania mine

The preparations included the building of a tug and barges on Lake Chelan, construction of a road from the lake to the mine, clearing a townsite in heavy timber, and building a mill, a temporary diesel power plant, four modern dormitories, 12 cottages, a mess hall, and other structures. At the same time the mine has been developed for operation and a 50-mile power line has been built from Chelan by the Washington Water Power Co.

For the next few years the ore will be drawn from levels above the adit, which connects directly with the mill.

Looking west at the Pend Oreille mill, Metaline Falls, Washington. 1, 500-ft. adit; 2, head of 200-ft. shaft to the 700-ft. level

The ore is low-grade copper but it also contains a useful amount of gold. The concentrates from flotation and a blanket plant will be placed in 5-ton covered containers, trucked down to Lake Chelan, taken by barge down the lake, trucked a short distance to the Okanogan branch of the Great Northern Railway, and there dumped loose in box-cars for shipment to the Tacoma Smelter.

Credit for the rapid work already performed is due to C. P. Browning, general manager; George C. Lipsey, general superintendent; A. C. Munro, and the other officials. These men were transferred to the Holden mine from the Britannia Mining and Smelting Co., a subsidiary of Howe Sound Co., that operates the Britannia mine on Howe Sound, 30 miles north of Vancouver, B. C. Mr. Browning is manager of both properties. Their familiarity with conditions, which are quite similar in the two regions, is one of the reasons for the success of the preparations. The results afford a pleasant contrast to some past expenditures in the State.

Gold Dredging in Central Washington

Along the Blewett Pass highway near the center of the State placer mining took place at the old localities on both sides of the summit. On the south side a larger outlay than usual was made along Swauk Creek to wash bench gravels adjacent to the area formerly dredged. North of Blewett Pass the gravels along Peshastin Creek were washed at several places, while quartz ore from the old camp of Blewett was shipped to the Tacoma Smelter.

The southeastern quarter of the State, lying mostly within the Columbia River lava field, is of limited interest to the mineral industry. However, in Benton County, which borders on Oregon, shallow wells in basalt provide a supply of natural gas for several small cities along the lower Yakima Valley. Recent drilling has been conducted there in search of a deeper source of gas with higher pressure. Drilling also has taken place near Yakima and Wenatchee, and east of Columbia River in the Frenchman hills. Certain wells that have penetrated at great expense for two or three thousand feet into or through the lavas and tuffs have found a deposit of tarry material apparently derived from petroleum but not yet fully identified. Another type of mineral occurring in the lava fields and other igneous areas consists of soluble salts of sodium and magnesium that fill certain lakes, giving them the appearance of ice-bound lakes in late winter. Some testing and production on a small scale have taken place at these lakes.

In the highland and mountainous region covered by the northeastern counties of Okanogan, Ferry, Stevens, and Pend Oreille, production is found at several points. At Republic, the largest gold camp in the State, the Eureka Mining and Milling Co. increased its operation until it was treating 85 tons of Quilp ore by cyaniding. The Knob Hill Mines, Inc., built a mill and cyanide plant which started last spring and later showed a capacity of more than 400 tons per day. The Northern Gold at Wauconda, the First Thought at Orient, and smaller mines were working. At several points along the Columbia River the sands were washed for gold. At Chewelah the mining of magnesite and the preparation of products continued.

Germania Tungsten Mine

An interesting event was the revival of the old Germania tungsten mine near Wellpinit in southern Stevens County about 50 miles northwest of Spokane. German owners worked this mine until the United States entered the war, and wolframite concentrates were shipped from it on both voyages of the submarine freighter *Deutchland*. About two years ago the General Electric Company purchased the mine, developed it further, and started operation anew. The work is under the direction of the company's Incandescent Lamp Department, Tungsten Mine Division.

Metaline District

In the extreme northeastern corner of the State the Metaline lead-zinc region has been the scene of much activity. Faced with a shortage of power, the Pend Oreille Mines and Metals Co. built a hydro-electric power plant of submerged type on the Pend Oreille River near its mine at Metaline Falls. The mill was enlarged to a capacity of 600 tons; a simple flotation process yields exceptionally rich concentrates of galena and zinc blende. American Zinc, Lead, and Smelting Co., through Metaline Mining and Leasing Co., drove a mile-long adit at river level to reach some deposits explored from the surface. The Grandview mill was put in commission to treat these ores.

On the whole, in 1937 Washington had more mining activity and a greater production of most minerals, except coal, than for many years past.

Dayrock Production

Frank M. Rothrock, Spokane, Wash., president of Dayrock Mining Company, reports that at the present low price of lead, 1938 does not promise to be as good a year as 1937. Last year the company milled 5,685 tons of ore and shipped 130 dry tons of crude ore from its mine near Wallace, Idaho. Gross metal contents amounted to 56,738 ounces of silver, 1,653,376 pounds of lead, and 39,201 pounds of recoverable zinc. Lead provided 68.5 percent of the gross income, silver 30.1 percent, and zinc 1.5 percent. Net profits of the company in the year were $13,360 after deductions.

The Role of Minerals in Present World Unrest†

• ***Isolation of U. S. From Threatened Controversy Between "Haves" and "Have-Nots" Held Impossible***

By C. K. LEITH
University of Wisconsin

IN the last few years the demand for territory containing mineral resources, by certain nations, has become one of the major threats to world peace. Minerals are not the only resources sought, but they are the spearpoint of the demand, for special reasons. They are the basis for heavy industry, for guns, ships, transportation facilities, and for mechanization in general. Ultimate capacity to sustain modern war is limited by their availability; they are exhaustible; they cannot be reproduced; in many cases they occur within a narrow geographic range; they cannot be legislated into existence, and substitutions are possible only to a limited degree.

The problem in its present form is really new, because the scale of modern use is now immensely greater than anything in history. As a direct result there has been increasing concentration on the few really large mineral reserves capable of meeting the new scale. There are not enough of these large sources to go around among the nations. The inevitable consequence, therefore, has been ever-increasing necessity for international movements of minerals.

War Emphasized Importance of Minerals

Before the Great War this situation had developed so gradually, and there had been so little hindrance to movements of minerals between nations, that the full extent of the interdependence of nations was not fully recognized. It was more or less taken for granted that world trade would provide the necessary supplies. The war brought a rude awakening.

The industrial nations of the world, as well as the nations hoping to become industrialized, began, really for the first time, to take stock of their mineral positions, with a view to avoiding the repetition of war experiences. The slogan became "never again". Self-sufficiency in regard to mineral supplies is now one of the main goals of economic nationalism.

Not all of the deficient nations are participating in the demand for the redistribution of the mineral wealth of the world, as illustrated by the Scandinavian countries. The desire for prestige—the so-called "power psychology"—obviously plays an important role.

The leaders of the "have not" group are Germany, Italy and Japan. The principal "have" nations are the United States, which is the world's greatest producer, owner, seller and consumer of minerals, and the British Commonwealth of nations, endowed almost as richly as the United States. Within and without their boundaries they together control about three-quarters of the world's mineral supplies, and they furthermore control the seas over which these supplies are transported. Classed with the "have" nations are France and its colonies, though their resources are secondary in importance. Russian resources, while considerable, are less than most people think, when measured by its own needs.

Significantly the "have not" states are dictatorial, while the states controlling much the larger part of the world's mineral supplies are democratic.

Fruitless Efforts at Self-Sufficiency by "Have-Nots"

In spite of notable gains as to certain minerals, the efforts of the "have not" states to become self-sufficient in minerals have essentially failed. There is much popular misconception about the results, because of the failure to take into account the required scale and cost. There have been notable technological advances in the use of low grade ores, in the extraction of oil from coal, in the creation of new alloys, and in substitutions. On the other hand, propaganda, political and commercial, is playing its part in the overstatement of the net results and in the failure to point out their essential limitations and disadvantages. Science and political will can do wonderful things, but an objective analysis of specific accomplishments to date shows that the effort toward self-sufficiency has only slightly lessened the requirements for international flow of minerals. For that matter, it may only have retarded the normal expansion of flow required by the growth of industry. Furthermore, the huge cost of the effort is largely offsetting the advantages claimed. The longer the effort lasts, the more difficult the problem becomes. The situation has already become so acute for some countries that the campaign would long since have stopped were it not under the immense pressure of political enthusiasm.

† Talk presented over the British Broadcasting Corporation network as part of a weekly series called "The Way of Peace." A more thorough discussion of this same subject, by Dr. Leith, will appear in the April number of Foreign Affairs under the title "Mineral Resources and Peace."

Germany a Striking Example

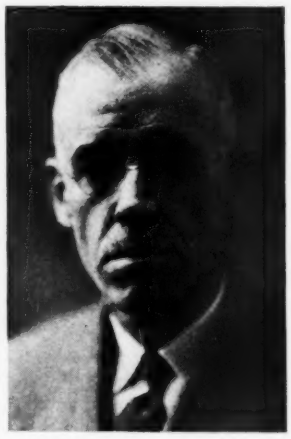
To give point to these generalizations, let us look at Germany's attempt to become self-sufficient in iron, oil, and copper. I shall use figures prepared by the U. S. Bureau of Mines. Before the war, when Lorraine was still a part of Germany, 92 percent of the German requirements for iron ore were obtained from domestic sources. With the loss of Lorraine, Germany began intensive development of her miscellaneous low grade deposits of iron ore and the increased collection of scrap, which together now contribute about a third of her total requirements for iron. She plans to bring this proportion up to about 40 percent by the use of ores of such extremely low grade that the operation must be heavily subsidized. Already the cost of producing pig-iron from domestic ores is double that from higher grade imported ores. In short, while Germany has slightly lessened her dependence on foreign iron ores, she has only done so at excessive cost, and she will still depend on foreign sources for about 60 percent of her supply. So vital has become her dependence on the iron ores of northern and central Sweden that the control of these deposits in case of war begins to loom as an important strategic problem.

Germany is restricting imports of oil by the development of domestic oil resources and the manufacture of oil products from coal. The final production cost of gasoline is now roughly four times the world market price. Huge expenditures are being made in the hope of bringing domestic production up to about half of the total requirements.

The German production of copper, mainly from the Mansfield copper district, amounts to about 14 percent of the need. She hopes to raise this output up nearly to 25 percent. The industry is very heavily subsidized and the cost of copper is far above the world price. At best it seems unlikely that Germany can ever be free of dependence on foreign sources for nearly three-quarters of her supply. In her effort to avoid the importation of copper, Germany has decreed the substitution of aluminum, magnesium, and other light metal alloys, wherever possible, but the total effect of such substitution is only a minor reduction in the needed quantity of copper.

Without going through the entire list of minerals, I may summarize by saying that the net result of the effort leaves Germany still dependent largely, in some cases wholly, on foreign sources for its requirements of at least 15 industrial minerals. The deficiencies in iron, oil and copper are the most critical because of the volume required. Most of the remainder are used in small enough volume to permit the accumulation of stocks sufficient to tide over short emergency periods, though perhaps not enough to carry the nation through a long war.

Offsetting the gains Germany has made are the growing costs and difficulties of securing the minerals still needed from foreign sources, due to the growing handicap of exchange. The effort in minerals is only a part of the general movement toward economic nationalism which is limiting the exchange of goods and Germany's capacity to pay for foreign raw materials. Because of exchange, also, Germany's purchases are being transferred to secondary sources of mineral supply.



DR. C. K. LEITH

If the German domestic effort toward self-sufficiency in minerals promised real success, there would be less pressure for the return of colonies or for the acquisition of political control of other territory. It is precisely because it is not succeeding, and is at the same time narrowing access to the world raw material markets, that Germany is now demanding political control of raw material sources outside of its boundaries.

If time permitted I might tell much the same kind of a story for Italy and Japan. In neither case have recent acquisitions of territory supplied essential deficiencies.

Having sketched the problem in these very bald outlines, what is the solution? I do not presume to have it, but among the possible alternatives I wish to call particular attention to one.

Freer Flow Advocated

The world as a whole has plenty of raw materials to supply all nations, and the rational procedure would seem clearly to be the lowering of many barriers against their flow. The success of this procedure, however, depends on some guarantee of collective security, for which, to express it mildly, there seems to be little present hope.

There is always the chance of internal revolution to upset autarchic policies. There is a chance that dictators may change their minds. However, there is much discouraging evidence that present policies will persist, which will mean even more pressure for control of foreign mineral supplies.

Cessation of territory on a scale large enough to satisfy the needs of "have not" nations would mean the transfer not only of colonies but of important self-governing regions. Simple arithmetic shows that parts of the English speaking, or French or Russian domains would have to be included, to say nothing of their wider interests in the mineral industries. However these territories and interests were acquired, whatever the justice of holding them, whatever the merit of the demand for redistribution, I assume that it will be politically impossible to give them away. Anything short of such wholesale transfer would still leave the "have not" nations in such an inferior position in regard to mineral supplies that the effort to obtain them must logically continue.

Isolation of U. S. From Controversy Held Impossible

Isolation from the controversy is impossible for the "have" nations, and particularly for the United States, for the simple reason that it is the raw material base for their industrial position which is under attack. Their mineral frontiers include potentially threatened areas.

Finally, there remains a possible course of action which has received much less public discussion than the others but which I think, as a student of resource problems, is likely to be forced by events, and that is the use of the great power inherent in the possession of raw materials by the democratic countries, together with their control of the sea, for the forceful maintenance of a certain amount of law and order in the world—for the organization of peace—for collective security. The traditional idea that ultimate military power is mainly

(*Concluded on page 55*)

RECENT TRENDS in ORE DRESSING†

• *Progress in Jigging, Tabling and Flotation Continues*

By R. S. DEAN
Chief Engineer
Metallurgical Division
U. S. Bureau of Mines

SO MANY developments in ore-dressing throughout the world were publicized last year that space precludes reference to more than a few of them. To be fully informed, the American metallurgist and millman must follow the experiments and improvements being made in Canada, Mexico, the Philippines, Australia, and South Africa as well as in the United States. Adaptations from one country to another are frequent, being made possible by visits and through the technical press. More and more attention is given to removing waste and impurities from ores before they are crushed and dressed, and to the high recovery of sulphide minerals in a variety of machines. Such operations leave residues or tailings of little value, and they are dumped or pumped away; but tailings from earlier milling are being profitably treated.

In the treatment of gold and silver ores there appears to be an almost endless number of combinations between cyanide and flotation plants. The use of motorized tractors, huge trucks, and earth-moving equipment are influencing the mining of capping and surface ores from once-abandoned old properties. Such ores often contain impurities that can be successfully floated but will interfere with cyanidation.

Sorting is a part of ore-dressing and may be applied to almost every mineral, including coal and scrap metals. It is an old method, dating back at least four centuries, and may be seen in use at many modern mines and plants. Von Bernewitz discusses many kinds of sorting in *The Mining Congress Journal* for December 1937.

Jigs

The use of and satisfactory results from jigs, particularly for gold and silver ores and dredged gravel, is growing. The millman has the choice of the Allis-Chalmers (Woodbury improved), Bendelari, Cooley, Cottrell, Denver, Harz, Neill, and Pan-American types. Excepting the last named, which is hydraulically operated, all of these jigs have mechanical movement. Jigs give good service as scavengers and collectors of coarse minerals and gold from mills. The material may be drawn off continuously or intermittently for grinding and further treatment, which permits better recovery from the rest of the pulp.

Tables

Some millmen would have us believe that fewer shaking tables are being used each year; but this is not so. They are still to be found in many plants doing the main sand and slime concentration, roughing work, separating the sulphides, or as pilot machines following flotation cells. Tables will never be completely discarded. They are still giving satisfactory results on pitchblende-silver ore near the Arctic Circle in Canada, on gold-silver ore in New Zealand, on molybdenum-vanadium-gold-silver-lead ore in Arizona, and on platinum metals in Transvaal, to name a variety of applications.

Flotation

During 1935, the last year for which statistics are available, unpublished as yet for lack of funds in the Bureau of Mines, 49 million tons of nonferrous ore was mined. This is an increase of 13, 25, and 23 million tons when compared with the output in the three previous years. The tonnages for 1936 and 1937 were much larger than that for 1935. Of the ore milled in 1935, 75 percent was concentrated; and of this, 94 percent was obtained wholly or partly by flotation. Straight flotation accounted, in round figures, for 19.5 million tons; gravity plus flotation, for almost 17 million tons; and straight gravity, for 250,000 tons. In 1935 the reagents averaged 3.25 pounds per ton of ore, a much smaller quantity than was used in the 4 preceding years. Lead-zinc ores consumed 4.5 pounds per ton; copper ores, 3.75 pounds; zinc ores, 1.66 pounds; gold-silver ores, 0.75 pound; and lead ores, less than 0.5 pound.

Experimentation on the possibilities of flotation were continued, and its practicability was proved on plant scale on cement raw materials, molybdenite, vanadinite, talc, and scheelite, to name only a few minerals.

Reagents continue to be the subject of laboratory research and plant operation. Bassett reviewed the xanthate patents in the *Canadian Mining Journal* for April, May, and June 1937. *Ore-Dressing Notes* 7, of the American Cyanamid Co., entitled "Flotation Reagents," describes the better known and commonly used reagents, which to use and how to use them on certain ores, and their consumption. Nevett, in *Proceedings* of the Australasian Institute of Mining and Metallurgy for mid-1936, gave a detailed dissertation on the application and functions of chemical reagents in flotation, as did Cornell in *The Mining Journal*, Arizona, for November 30, 1937. In *Report of Investigations* 3333 of the Bureau of Mines, Dean, Clemmer, and Cooke look into the use of wetting agents as frothers, selective collectors, and emulsifiers.

At Matahambre, Cuba, separate handling of the middling has simplified the flotation section of the mill, according to Kirchner, Bean, and White in *Engineering and Mining Journal* for November 1937. Formerly, the

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conventional "middling-return-to-the rougher" cells was practiced; now, the middling is sent to a special circuit of six cells. Pneumatic-type flotation cells operating at 2.5-pound pressure are employed. The ore averages 12.3 percent chalcopyrite (4.25 percent copper) and 5.2 percent iron pyrite. Recovery is 96 percent at a milling cost of 48 cents per ton, of which 9 cents is for reagents.

At the Government Gold-Mining Areas, Transvaal (not government owned), the sand underflow from cones carries 3 percent iron pyrite. This pulp is now floated in Fagergren machines at the rate of 1,000 tons a day, ethyl xanthate and pine oil being used. The concentrate assays 70 pennyweight per ton. It is reground to 93 percent through 350-mesh and cyanided. The gold recovery is 97 percent, which is 3½ percent higher than with direct leaching of the sand. The flotation tailing is leached.

Flotation at the Balatoc mine, Philippines, has been superseded by tabling the slime to remove the coarse particles before it is thickened. This is an all-slime plant. On the other hand, according to Weekley and Norton and Weekley and Iverson in *Engineering and Mining Journal* for August 1937, the San Mauricio has tables and Weinig flotation cells, while the Suyoc has corduroy and Fagergren and Parker flotation cells. Concentrates from San Mauricio are smelted, whereas those from Suyoc are ground and cyanided.

Flotation on the Bulolo dredges, New Guinea, has given way to jigging, tube-milling, and amalgamating. The total cost of producing 1 ounce of gold at Bulolo is $10.70, according to *Banks* in the September 1937 *Bulletin* of the Institution of Mining and Metallurgy.

Malozemoff, in *Engineering and Mining Journal* for September 1937, discusses the problems of jigs on dredges—rougher and cleaner jigs and their position in the gold-saving equipment, as close to the screen as possible.

A strange reversal of methods has taken place at Broken Hill, Australia: The North Broken Hill, handling 1,000 tons a day, was strong for straight flotation, whereas the Zinc Corporation believed in tabling and floating an equal tonnage. The latter then ran large-scale tests on straight flotation and adopted it. Meanwhile, the North Company is installing tables to operate with flotation. The Broken Hill South uses tables and flotation. All the mines, including the Sulphide Corporation, operate rolls, as always.

Ore from the Patino mines, Bolivia, averages 3.3 percent tin as broken, and, after sorting out 13 percent of waste, the mill heads assay 3.7 percent tin, according to Deringer and Payne in *Engineering and Mining Journal* for April, May, June, and July 1937. In the ore-dressing plant at Catavi the ore is trommeled, crushed, screened, classified, jigged, buddled, and tabled. Close sizing of the table feed and tabling are important factors in producing high-grade concentrates (46 percent tin) and good recovery (82 percent). The gravity concentrates are freed of sulphides by flotation, which raises the grade of the former from 46 percent to 64 percent. One percent dump ore is concentrated to 1.4 percent by sorting and then passes through the same dressing operations as the mine ore. The recovery is 72 percent and concentrates assay 63 percent tin.

Iron Ore Concentration

In normal years of United States iron-ore production, there is a steady gain in the tonnage that is improved in grade by screening, jigging, classifying, cones, tabling, washing, and magnetic separating. At present, 20 percent of the total ore mined is so treated—brown, hematite, and magnetite varieties. The chief purpose is to lessen the silica content, but the phosphorus content is reduced also. More attention is to be given to the red ore of Alabama; a sizable tonnage of brown ore is now being washed.

Further plant-scale runs are being made to convert low- and medium-grade nonmagnetic iron oxides to the magnetic oxide for concentration. As iron ore is cheap, costs must be low and must be considered. Davis, of the University of Minnesota, has done much pioneer work; and at Cooley, Minn., the University and Butler Brothers erected a 250-ton calcining and magnetic separation plant, which has given satisfactory results but it is not the final design. The various problems encountered and the results in detail are to be found in *Bulletin* 13 of the University, and in briefer form in *Technical Publication* 731 of the American Institute of Mining and Metallurgical Engineers.

Industrial Minerals

Good summaries of methods of treating or concentrating the nonmetallic minerals (excluding fuels) are to be found in *Industrial Minerals and Rocks*, recently published by the American Institute of Mining and Metallurgical Engineers. Complete indexing, with full cross-references, insures convenience in consulting the volume.

Ore Testing

As ore-testing is or should be the prelude to ore-dressing, considerable information of a suggestive nature is

Ore-dressing section of the Electrometallurgical Laboratory, U. S. Bureau of Mines, Boulder City, Nevada

to be found in Bureau of Mines *Report of Investigations* 3328 by Davis and others. Thirty different ores were tested completely to ascertain the most suitable dressing operation. The tests included tabling, flotation, magnetic separation, and cyanidation. Flowsheets were devised. A second report (R. I. 3370) will be available early in 1938. It widens the scope of ore-testing.

The reports of the Ore-Dressing and Metallurgical Laboratories, Ottawa, Canada, and of the government laboratories at Kalgoorlie, Adelaide, and Melbourne, Australia, are of considerable value to the mining industry and metallurgical profession.

Treatment of Tailings

Treatment of mill residues or tailings adds considerably to the world's production of metals. Excepting the old tailings from certain groups of mines, such as in the Tri-State district of Missouri-Kansas-Oklahoma, where a quarter of the zinc output is derived from retreatment, the total of all metals recovered from dumps is unknown in any country. At the present time, and for the future, dumps of hundreds of millions of tons await some type of ore-dressing prior to treatment for the extraction of economically recoverable minerals.

In *Engineering and Mining Journal* for December 1937, Netzeband and Heinz of Joplin give a good description of the preparation of the 50,000,000 tons of workable zinc-lead tailings in the Tri-State district mentioned. Briefly, after careful sampling, the tailings are dressed by equipment that includes screening, rolling, ball-milling, jigging, tabling, and floating. The average tailings plant handles 60 to 80 tons an hour; and there were 29 of them in operation during 1937. The concentrate is of good grade, and the cost ranges from 20 to 45 cents per ton of heads treated.

In *Report of Investigations* 3349 (1937) of the United States Bureau of Mines, Oldright and others tell of the experiments made for the recovery of potash from the Utah Copper Company's enormous dump of residues. These, and those at other large porphyry copper mines in the West, contain 5 to 10 percent K_2O. For treatment, it is recommended that the tailing be first heated to 900° C., and then mixed hot with sodium chloride and coal. This is then calcined, cooled, and leached with water before final treatment.

In *The Mining Journal* (London) for March 13 and 20, 1937, von Bernewitz reviews cyanidation of tailings throughout the world. The preparation of residues containing gold and silver involves screening to remove rubbish, possibly some grinding for certain materials, and mixing of dried slime with sand for leaching, or pulping slime for agitation and filtration. Much ingenuity has been employed in overcoming more or less difficult problems in various surroundings and in the reclamation of the tailings. Sampling is of much importance.

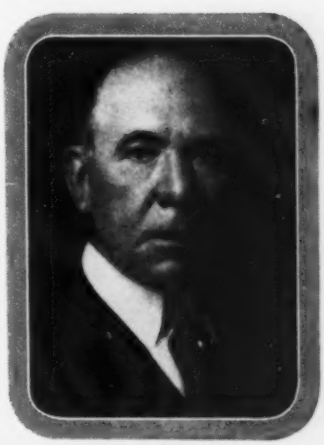
Jackling Takes Over AIME Helm

ATTENDED by some 2,300 delegates and guests, the 148th meeting of the American Institute of Mining and Metallurgical Engineers, held in New York February 14-17, was a success from start to finish.

The technical sessions during the four days, covering all phases of mining, metallurgy, petroleum, safety, etc., had an unusually representative group of interesting papers to keep delegates more than busy endeavoring to keep pace with all the subjects in which they were interested. At an all-Institute meeting on Monday afternoon, some 450 members heard Dr. Harold G. Moulton, president of the Brookings Institute, present a clear and succinct analysis of the complex subject, "Interrelations of Technology, Economics and Government in a Balanced and Progressing Economy"; and Prof. Leo Wolman, of Columbia University, discuss the bright and dark sides of the timely topic, "Labor and Capital."

Social events of the week were climaxed at the annual banquet on Wednesday evening when over 900 members and their ladies overflowed the main floor of the Waldorf-Astoria ballroom into the balcony. Acting as toastmaster was R. C. Allen, retiring president of the Institute. Distinguished service in various fields of mining was recognized by presentation of the following honors: Honorary membership in the Institute to J. V. Reynders (introduced by Bradley Stoughton); insignia of the Legion of Honor in the Institute (representing completion of 50 years membership), to H. D. Conant, Karl Eilers, William Gerhauser, D. S. Jacobus, Henry Louis, E. C. Means, Erskine Ramsay, T. A. Rickard, Olaf Wenstrom, and W. F. Wilkinson; the Robert W. Hunt Award to T. S. Washburn and J. H. Nead (introduced by Francis B. Foley); the J. E. Johnson, Jr. Award to R. A. Lindgren (introduced by Clyde E. Williams); the James Douglas Medal to Hal W. Hardinge (introduced by C. H. Benedict); and the Anthony F. Lucas Medal to Henry L. Doherty (introduced by J. R. Suman).

Culminating the evening's events was the formal induction into the presidency of the Institute for 1938 of Daniel C. Jackling. After tracing the distinguished career of Mr. Jackling, Mr. Allen finally turned over the gavel to the new president, who responded with timely words of appreciation and a pledge to continue the splendid work of predecessors. An excellent representation of western copper men were present to see Mr. Jackling take over the presidency.



D. C. JACKLING

Following the presidential reception in the adjoining lobby the guests danced during the remainder of the evening.

WHEELS of Government

• *As Viewed by A. W. Dickinson of the American Mining Congress*

LANDING from Europe last fall on the very day the stock market slid over the brink on its first dive into a descending spiral, the famed "Barney" Baruch, the intimate of Presidents, had several months in which to observe the state of affairs in his home country. Surely in reflection he must have compared the things of life which are good and which people enjoy in this country, with the decreasing freedom and the burdens borne by the populations of other lands. It must have been a crystallization of these thoughts to which he gave expression when he appeared recently before the special Senate Committee on Unemployment and Relief. In response to the questions of Senator Byrnes of North Carolina and the members of the Committee, Mr. Baruch was frank in stating that while he believed in the main that the objectives of the present administration were laudable and worthwhile, he further believed that the policies and program of the administration are almost entirely responsible for the business depression. He sounded the call for an immediate change in tax policies and pointedly called attention to the harmful effects of the present undistributed corporate earnings tax and the high rates on capital gains. He further stated if the people of this country are told at once in plain language that we are to continue with the American profits system of reward for individual effort, the depression will disappear in a very few weeks.

By many people the opinions voiced by Mr. Baruch are taken in part as a parallel to the more tempered thinking that has been indicated in recent weeks on the part of the administration adherents. Even in the procedure on the Revenue Bill, there was evidence in the House and there is now certainly evidence in the Senate of a change in attitude. It is significant that those primarily responsible for the undistributed profits tax have been noticeably out of the picture in the development of the Revenue Bill of 1938.

Taxation

Senate Finance Committee hearings on the Revenue Bill closed on March 21 after parts of only four days had been given to representatives of taxpayers to express their views to the Committee. Previously, after receiving the bill from the House, the members of the Committee had devoted three days of executive sessions to a discussion of the 321-page measure with Under-Secretary Roswell Magill and the staff of the joint Committee on Internal Revenue Taxation.

In the consideration of the bill in the House—after a long battle in the Committee on Ways and Means over the controversial 1B Section, which provided a 20 per cent surplus tax on "closely-held corporations"—it became increasingly evident that the undistributed corporate earnings tax and the freezing of capital by the tax on capital gains are almost without defenders. Under the leadership of Representative McCormack of Massachusetts, Section 1B went out of the bill by a record vote of 233 to 153. Additional indication of the spirit of revolt came with the Thompson amendment offered from the floor of the House without Committee sanction, which placed an import excise tax on pork and pork products; and further with floor acceptance of the 25 cents a gallon increase in the whisky tax.

Chairman Pat Harrison of the Senate Finance Committee as well as many another Senator has stated that the Senate is going to pass a Revenue Bill which will be a real encouragement to business enterprise. He has declared for a series of flat rates on corporation income as well as for a flat rate of from 12½ to 15 per cent on capital gains. In appearing before the Committee for the American Mining Congress, Secretary Julian D. Conover urged the adoption of tax policies which have been consistently advocated by the organization, as embodied in the declarations of the Salt Lake City Convention in September, 1937, and of the Annual Meeting in Washington on December 2, 1937. D. A. Callahan, also appearing for the American Mining Congress, urged recognition of the "last in, first out" method of inventory accounting. Mr. Conover's and Mr. Callahan's statements will be found on pages 46 and 48 of this issue. It is now anticipated that the Finance Committee of the Senate will report a bill to the floor early in April and that the bill will be reported by the conferees of the two Houses soon after the first of May. This sets the stage for a possible adjournment of the Congress between May 15 and June 1.

Wage-Hour

A Subcommittee of the House Committee on Labor under the chairmanship of Representative Ramspeck of Georgia is now engaged in an attempt to write a wage-hour bill which will meet the approval of the full Committee on Labor. It is known that there are wide differences in the views of both the Subcommittee and the full Committee. In the main there are now four proposals before the Subcommittee which in brief are as follows:

1. Under a single administrator in the Department of Labor, nine-man industry boards would be appointed to determine wage and hour standards for industries whose standards are below 40 cents an hour and over 40 hours per week. No standards to be set for industries whose standards are now higher than 40-40. No exemptions would be provided for specific industries, nor could hours of work exceed 40 even by payment of time and one-half for the overtime.

2. Under a single administrator in the Department of Labor, industrial boards would be appointed and wage scales set up based on the 1934 wage standards of the NRA codes. No action would be taken for industries whose wage scales are now above those bases. The administrator could not impose standards which would vary more than 10 per cent above or below the 1934 NRA code standards. No industries operating below NRA standards would be exempt.

3. The American Federation of Labor statutory 40-40 Bill, with enforcement through the Department of Justice based on complaints filed by anyone who charges violation of the law, after such complaints had been substantiated by investigation.

4. A proposal by Subcommittee Chairman Ramspeck which would declare that substandard wage and hour standards in interstate commerce are an "unfair trade practice" under the Federal Trade Commission Act, placing administration under the Federal Trade Commission, and enforcement under the Attorney General's office and the courts.

It is now reported that the Ramspeck Subcommittee leans toward flexible standards on hours and wages with wide authority given to a board to set differentials warranted by geographic and local conditions. Among the witnesses with whom the Subcommittee is taking counsel, Benjamin Cohen (of Cohen-Corcoran fame) is reported to have expressed doubt regarding the constitutionality of fixed wage and hour standards which might result in a proper charge of deprivation of property without due process of law.

Anti-Trust

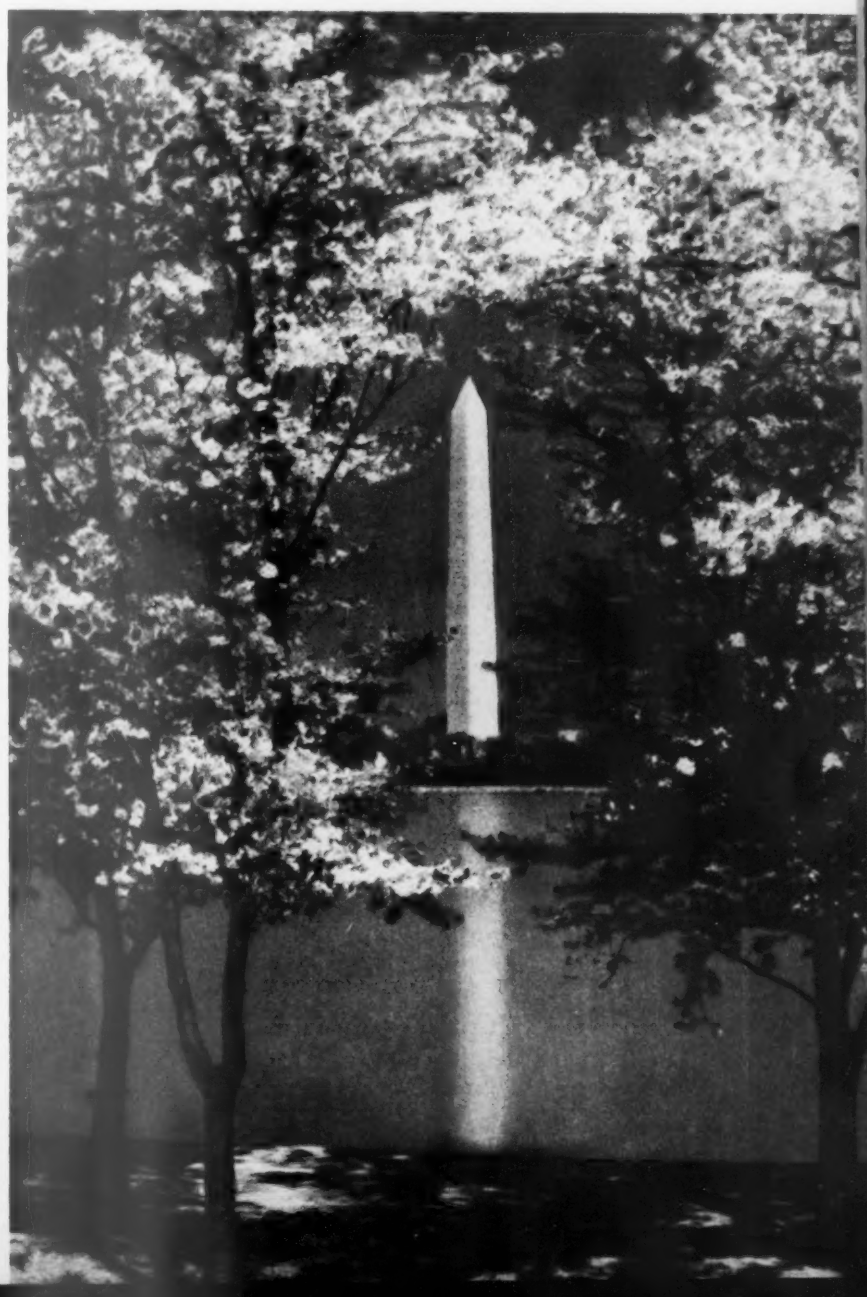
This subject has attracted less public attention in the past month, apparently because of the seriousness of the general business situation. Bernard Baruch's criticism of a broad tax on alleged monopolies, qualified only by the statement that "if certain monopolies are bad, they should be restricted," is believed to have reflected a change in policies. Hearings on the Borah-O'Mahoney Federal Licensing Bill have been proceeding intermittently and without attracting wide attention or interest. It is generally understood that a commission will be appointed to investigate the whole question of prices, alleged monopolistic practices and the revision of the anti-trust laws.

Foreign Trade Agreements

State and district mining associations and national organizations of producers joined with individual mining men throughout the country in the past month in registering protests and in filing briefs against reductions in duties under the proposed United Kingdom and Canadian Foreign Trade Agreements on lead and zinc and their products, tungsten, feldspar, fluorspar and many other mineral products. Hearings were held by the Committee for Reciprocity Information on March 14, 15, 16, 21 and 22 on these various metals and minerals. On the first two days a number of Congressmen appeared to protest any duty reductions, including Representative J. Will Robinson of Utah, who appeared for lead

(*Concluded on page* 49)

Cherry Blossom Time



Calling All

to Cincinnati

COAL MEN

INTEREST in formulating detailed plans for the forthcoming Fifteenth Annual Coal Mining Convention and Exposition of the American Mining Congress to be held in Cincinnati May 2-6 has been keener than ever, in spite of the recent recession in business. Final plans are rapidly taking shape under the enthusiastic leadership of R. L. Ireland, Jr., National Chairman of the Program Committee, and Louis Ware, General Chairman of the Committee on Arrangements, with the assistance of all committee members.

Program

As noted in the accompanying preliminary program, the task of selecting subjects to be presented and discussed at the convention sessions is virtually completed. Five sessions will be devoted entirely to discussion of specific subjects covering important phases of modern coal mining—a distinct improvement over previous practices of scattering papers on related matters through different sessions. The program will include fewer main papers than in other years, and special arrangements are being made to permit

PRELIMINARY PROGRAM

MONDAY, MAY 2

MORNING SESSION

Opening of Convention:
JULIAN D. CONOVER, Secretary, American Mining Congress

INTRODUCING:
HOWARD I. YOUNG, President, American Mining Congress
E. J. NEWBAKER, Chairman, Advisory Council, Coal Division
R. L. IRELAND, JR., National Chairman, Program Committee.
WM. E. GOODMAN, Chairman, Manufacturers Division

METHODS OF BREAKING DOWN COAL AT FACE
C. F. CONNELLY, General Manager, Kemmerer Gem Coal Co.

FACTORS AFFECTING CHOICE OF CUTTING BITS AND CHAIN LACING
W. D. INGLE, JR., Ingle Coal Co.

MODERN VENTILATING INSTALLATIONS
WM. NORRIS, JR., Safety Director, Carter Coal Co.

AFTERNOON SESSION

Surface Preparation

COAL WASHING, CRUSHING AND BLENDING
E. C. CARRIS, Charge of Preparation Dept., Island Creek Coal Co.

PRACTICAL LIMITS OF SLATE REMOVAL
D. B. BAIRD, Chief Inspector, Philadelphia & Reading Coal & Iron Co.

METHODS OF DRYING WASHED COAL
K. R. BIXBY, General Manager, Midland Electric Coal Corp.

PREPARATION FOR SPECIAL FUEL USES
MALCOLM MACFARLANE, Fuel Inspector, N. Y. C. System.

TUESDAY, MAY 3

MORNING SESSION

NEW FEATURES IN HAULAGE EQUIPMENT
(a) Automatic Mine Car Couplers—PETER F. LOFTUS, Cons. Engr., Pittsburgh, Pa.
(b) Hydraulic Brakes on Mine Cars—
F. K. DAY, Gen. Mine Supt.
E. P. SELBY, Mine Supt.
} Pardee & Curtin Lumber Co.
(c) Mine Locomotives—CARL LEE, Elec. Engr., Peabody Coal Co.

NEWEST DEVELOPMENTS IN CUTTING MACHINE PRACTICE
PAUL WEIR, Mining Engineer, Chicago, Ill.

NEW EQUIPMENT AND METHODS IN STRIP MINING
IRA CLEMENS, Pres., Commercial Fuel Co.

UNDERGROUND WATER IN NORTHERN ANTHRACITE FIELD
J. F. K. BROWN Asst. Gen. Mgr.
H. H. OTTO, Mng. Engr.
} Hudson Coal Co.

TUESDAY AFTERNOON SESSION

Conveyor Mining

PROBLEMS TO BE CONSIDERED BEFORE INSTALLING CONVEYORS
R. G. Pfahler, Mng. Engr., The Berwind-White Coal Mining Co.

PROBLEMS IN GATHERING, LOADING AND MOVING CONVEYOR EQUIPMENT
M. A. Sharp, Mng. Engr., Union Pacific Coal Co.

POWER DISTRIBUTION FOR CONVEYOR INSTALLATION
L. H. Schnerr, Div. Mgr., Consolidation Coal Company

MINING METHODS IN 24-INCH SEAMS
W. C. Chase, Genl. Supt., Alabama By-Products Corp.

WEDNESDAY, MAY 4

MORNING SESSION

Mobile Mechanical Loaders

PROBLEMS TO BE CONSIDERED BEFORE INSTALLING MECHANICAL LOADERS
D. D. Wilcox, Genl. Supt., Superior Coal Co.

CLEANING AND DEGRADATION PROBLEMS WITH MECHANICAL LOADING
Chas. B. Baton, Vice Pres., Baton Coal Co.

TRANSPORTATION PROBLEMS WITH MECHANICAL LOADING
J. W. Woomer, Chief Mng. Engr., Hanna Coal Company of Ohio

PROBLEMS IN MINING THIN SEAMS WITH MECHANICAL LOADING
Wm. Cunningham, Supt., Linton-Summit Coal Co.

AFTERNOON SESSION

Safety

USE OF MOTION PICTURES IN A SAFETY PROGRAM
C. R. Stahl, Div. Supt., Koppers Coal Co.

SAFETY TRAINING FOR EMPLOYES
John Lyons, Safety Engr., Bell & Zoller Coal & Mng. Co.

REDUCING HAULAGE AND MACHINE ACCIDENTS
David W. Jones, Supt., Princeton Mining Co.

SAFETY CONTESTS (INTRA-COMPANY)
C. E. Young, Personnel Mgr., Wheeling Township Coal Mining Co.

THURSDAY, MAY 5

MORNING SESSION

EQUIPMENT REPAIRS AND SHOP PRACTICE
V. D. Picklesimer, Master Mechanic, South East Coal Co.

UNDERGROUND POWER DISTRIBUTION
C. C. Ballard, Master Mechanic, The New River Co.

SHAFT SINKING METHODS
Percy G. Cowin, Salmon & Cowin, Inc.

PAPER: SUBJECT AND AUTHOR TO BE ARRANGED

AFTERNOON SESSION

Management and Supervision

SUCCESSFUL ADJUSTMENT BETWEEN MANAGEMENT AND EMPLOYES
J. R. Sharp, Director of Public Relations, Philadelphia & Reading Coal & Iron Co.

PERSONNEL TRAINING
A. D. Sisk, Safety Dir., Big Sandy-Elkhorn Coal Operators Assn.

RESPONSIBILITY OF MINE OFFICIALS IN PERSONNEL MANAGEMENT
Speaker to be arranged

PAPER: SUBJECT AND AUTHOR TO BE ARRANGED

FRIDAY MORNING, MAY 6—EXHIBITORS' DAY

No convention sessions—to permit uninterrupted inspection of exhibits

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open discussion following each address. The special subjects to be discussed are as follows: *Surface Preparation* on Monday afternoon; *Conveyor Mining* on Tuesday afternoon; *Mobile Mechanical Loaders* on Wednesday morning; *Safety* on Wednesday afternoon; and *Management and Supervision* on Thursday afternoon. Friday morning will be Exhibitors' Day, with no convention sessions held, in order to permit uninterrupted inspection of exhibits. Selection of session chairmen and discussion leaders for each paper is under way and final details of the program will be announced in the May number of the Journal.

General Arrangements

Following the meeting of the General Committee on Arrangements in New York February 18, presided over by Chairman Louis Ware, president, United Electric Coal Companies, the various committees have been functioning in high gear, planning details for stimulating attendance; building publicity; arranging entertainment; planning contests which will assure attention to all exhibits; arranging for the smooth functioning of each convention session; and planning suitable methods of welcoming the delegates upon arrival.

The complete membership of these various committees, unannounced heretofore in the Journal, is as follows:

Attendance: Charles F. Hamilton, Binkley Coal Co., chairman; A. S. Knoizen, Joy Manufacturing Company, vice chairman; W. L. Affelder, Hillman Coal and Coke Co.; W. F. Barnes, Jeffrey Manufacturing Co.; W. J. Borries, Dawson Daylight Coal Co.; Degen Boyd, Excelsior Coal Co.; H. V. Brown, The Brown-Fayro Co.; E. F. Carley, E. I. du Pont de Nemours & Co., Inc.; Wm. P. Cayton, Rail & River Co.; Walter F. Clarke, Independent Coal Co.; H. G. Conrad, Knox Cons. Coal Corp.; W. H. Davis, Simplex Wire & Cable Co.; G. R. Delamater, The W. S. Tyler Co.; A. W. Fisher, McGraw-Hill Publishing Co.; E. B. Gellatly, Jeffrey Manufacturing Co.; E. P. Humphrey, Stonega Coke and Coal Co.; J. D. James, Goodman Manufacturing Co.; T. E. Jenkins, National Fuel Co.; W. J. Jenkins, Consolidated Coal Co.; A. B. Jessup, Waverly, Lackawanna Co., Pa.; F. F. Jorgensen, Consolidation Coal Co.; F. J.

Maple, John A. Roebling's Sons Co.; J. B. Morrow, Pittsburgh Coal Co.; Harry M. Moses, H. C. Frick Coke Co.; L. S. Mosley, Marion Steam Shovel Co.; Geo. B. Pryde, Union Pacific Coal Co.; Erskine Ramsay, Alabama By-Products Corp.; W. C. Richards, A. Leschen & Sons Rope Co.; C. S. Robinson, The Buckeye Coal Co.; John T. Ryan, Mine Safety Appliances Co.; R. E. Salvati, Island Creek Coal Co.; E. W. Wanner, Hulburt Oil & Grease Co.; Henry F. Warden, American Coal Co. of Allegany County; J. C. Wilson, Ohio Brass Co.; and F. O. Wyse, Bucyrus-Erie Co.

Publicity: W. W. Rodgers, Westinghouse Elec. & Mfg. Co., chairman; John F. Coakley, Thomas A. Edison, Inc., vice chairman; Sydney A. Hale, Coal Age; R. P. Kelley, Timken Roller Bearing Co.; and B. E. Schonthal, B. E. Schonthal & Co., Inc.

Entertainment: John K. McCabe, Hercules Powder Co., chairman; L. F. Crouse, Monroe Coal Mining Co.; vice chairman; Ray Arms, Roberts & Schaefer Co.; C. P. Daniel, Enterprise Wheel & Car Corp.; H. B. Husband, Chesapeake & Ohio Rwy. Co.; A. B. Kelley, Humphreys Coal & Coke Co.; C. J. Sandoe, West Virginia Coal Co. of Missouri; Frank G. Smith, The Sunday Creek Coal Co.; W. D. Turnbull, Westinghouse Elec. & Mfg. Co.; J. R. Ulrich, Bethlehem Steel Co.; C. W. Waterman, McNally-Pittsburg Mfg. Corp.; A. R. Joyce, Wood Preserving Corp.; H. H. Taylor, Jr., Franklin County Coal Corp.; and M. M. Moser, United Electric Coal Cos.

Contests: V. J. Nolan, National Carbon Co., chairman; C. B. Officer, Sullivan Machy. Co., vice chairman.

Floor: E. B. Agee, Youngstown Mines Corp., chairman; C. W. Gibbs, Harwick Coal & Coke Co., vice chairman.

Welcome: E. R. Price, Inland Steel Co., chairman; E. J. Burnell, Link-Belt Co., vice chairman.

Mineral States Exhibits: M. M. Leighton, Illinois Geological Survey Division, chairman.

Entertainment

With entertainment comprising a most important phase of the entire convention program, no time has been lost in developing plans that will meet with most enthusiastic reception by all the guests. There is not going to be a dull moment throughout the four nights.

In the unavoidable absence of Chairman John K. McCabe, Vice Chairman L. F. Crouse presided at a meeting of the Entertainment Committee in Cincinnati March 4, at which general plans for each night were developed.

An innovation in this year's program will be "Jack Dempsey Night," featuring "two-fisted" boxing and wrestling bouts, scheduled for Wednesday. With the former champion signed to referee a bang-up card, the fighters are sure to give all they have, and there will be a number of novelty acts to round out the program. A "Jamboree Night" is scheduled for Monday, when informal festivities will include group singing, balloon dances, prize dances, "shag" and "big apple" demonstrations in which all may participate, and other headline novelty acts. On Tuesday night guests will forget their cares and troubles in the Pavillon Caprice of the Netherland Plaza as "Waikiki Night" is featured. A real Hawaiian atmosphere will be developed by elaborate decorations, leis, hula girls, a strolling Hawaiian instrumental unit, and appropriate entertainment features. The annual speechless banquet on Thursday will climax the four nights of entertainment. For this evening the committee is considering carefully a number of popular artists of the radio and stage, and definite announcement of their final choice will be made in the near future. You may count on a real headline attraction that you can't afford to miss.

One of the Abbott dancers in the famed London line appearing all four nights

Performing during all four nights will be the outstanding line of Merriel Abbott dancers, coming direct from a most successful engagement at the Dorchester House in London, previous to which they had won wide acclaim at fashionable cafes and casinos in Paris, Juan les Pins, Biarritz and Deauville, France. Anyone who has seen another Abbott line performing at the Empire Room of the Palmer House in Chicago may gather a vivid example of the excellency of the beauty and dancing ability of these girls. In addition there will be music by a headline orchestra, and quips, mimicry and general amusement by an outstanding master of ceremonies. The enthusiastic manner in which all members of the Entertainment Committee have pitched into their work insures successful effectuation of the slogan "not a dull moment," and the amusement features will be worthy of the wholehearted support and attendance of all those present at the convention.

Plans are also being prepared for special entertainment during the four days for the large number of ladies expected to be present. The tentative program includes a get-together luncheon Monday; a fashion show Tuesday morning followed by luncheon at a country club or some country inn; a bridge party and tea Wednesday afternoon in the beautiful Hall of Mirrors of the Netherland Plaza; and individual sightseeing trips on Thursday. Visiting ladies may be assured of a most pleasant sojourn in Cincinnati during the entire week.

Exposition

The leading manufacturers of mining machinery, equipment and supplies are cooperating to their utmost in arranging for one of the most outstanding expositions ever held. Demands for space this year have been

very heavy. Over 90 percent of those previously exhibiting will be represented, and 26 companies not present last year have taken place. A total of 146 companies will display their wares on the exposition floors.

That the manufacturers believe "where there's a will, there's a way," will be proven by their array of products. Almost every conceivable item of mining equipment from the smallest of hand tools and instruments to large cutting and loading machines and complete haulage units will be there for your inspection and study.

Advance publicity releases indicate that a number of machines never exhibited before will be presented for the attention of coal operators. A maximum amount of the equipment will be in operation to demonstrate its adaptability to every need of the modern coal mine.

Among those who will show the latest developments in the mine equipment manufacturers' world are:

Acme Compressor Co.
Advertising Displays, Inc.
Aerovent Fan Co.
Air Reduction Sales Co.
The Louis Allis Company.
Allis-Chalmers Mfg. Co.
American Brattice Cloth Corp.
American Bridge Co.
American Car & Foundry Co.
American Chain & Cable Co.
American Cyanamid & Chemical Corp.
American Mine Door Co.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
Atlas Powder Co.
Baker-Raulang Co.
Barber-Greene Co.
Bemis Bros. Bag Co.
Bethlehem Steel Co.
Black's Directory.
The Bowdil Company.
Broderick & Bascom Rope Co.
Brown-Fayro Co.
Bucyrus-Erie Co.
Calcium Chloride Assn.
Carnegie-Illinois Steel Corp.
Central Electric Repair Co.
Chicago Pneumatic Tool Co.
Cincinnati Mine Machinery Co.
Coal Mine Equipment Sales Co.
Coal Process Company.
Coal Times.
Coffing Hoist Company.
Columbia Steel Co.
A. D. Cook, Inc.
Cyclone Fence Company.
Deister Concentrator Co.
Deister Machine Co.
The Deming Co.
Differential Steel Car Co.
The Dorr Company, Inc.
Duff-Norton Mfg. Co.
E. I. duPont de Nemours & Co., Inc.
Dustlix Systems, Inc.
Thos. A. Edison, Inc.
Electric Railway Equipment Co.
Electric Railway Improvement Co.
Electric Storage Battery Co.
Enterprise Wheel & Car Corp.
Fairbanks, Morse & Co.
Flood City Brass & Electric Co.
General Electric Co.
Gibraltar Equipment & Mfg. Co.
Goodman Manufacturing Co.
Gulf Oil Corporation.
Halliburton Oil Well Cementing Co.
Harnischfeger Corp.
Hazard Insulated Wire Works Div., The Okonite Co.
Hendrick Mfg. Co.
Hercules Powder Co.
Hockensmith Wheel & Mine Car Co.
Hulburt Oil & Grease Co.
Imperial Bronze Mfg. Co.
Irwin Foundry & Mine Car Co.
I-T-E Circuit Breaker Co.
Jeffrey Manufacturing Co.
Joy Manufacturing Co.
The Joyce-Cridland Co.
Koppers Company.

JACK DEMPSEY
who will referee the Wednesday night boxing matches

The LaBour Company, Inc.
La-Del Conveyor & Mfg. Co.
A. Leschen & Sons Rope Co.
Link-Belt Company.
Lincoln Engineering Co.
Macwhyte Company.
Mancha Storage Battery Locomotive Co.
Marion Steam Shovel Co.
McGraw-Hill Publishing Co., Inc.
McLanahan & Stone Corp.
McNally-Pittsburg Mfg. Corp.
Mechanization, Inc.
Metal & Thermit Corp.
Mineral States Exhibits.
Mine Safety Appliances Co.
Mining Congress Journal.
Morrow Mfg. Co.
Mosebach Electric & Supply Co.
Myers-Whaley Co.
Nachod & U. S. Signal Co., Inc.

(*Concluded on page 55*)

I. Q. ANSWERS (Questions on Inside Front Cover)

1. FIFTEENTH ANNUAL COAL CONVENTION AND EXPOSITION, A. M. C.
2. FIFTEENTH ANNUAL COAL CONVENTION AND EXPOSITION, A. M. C.
3. FIFTEENTH ANNUAL COAL CONVENTION AND EXPOSITION, A. M. C.
4. FIFTEENTH ANNUAL COAL CONVENTION AND EXPOSITION, A. M. C.
5. FIFTEENTH ANNUAL COAL CONVENTION AND EXPOSITION, A. M. C.

REVENUE BILL REVISION

• *Mining Congress Presents Position of the Industry on Major Questions of Income Taxation*

STATEMENT of

JULIAN D. CONOVER

Secretary, American Mining Congress
In Appearance before Committee on Finance, United States Senate, March 21, 1938

I AM appearing for the American Mining Congress which represents all of the various branches of the mining industry of this country. We should like to urge the amendment of the bill which you have before you in seven specific ways.

First, we recommend complete elimination of the undistributed profits tax and substitution therefor at a flat rate of corporation tax.

We opposed enactment of the undistributed profits tax in 1936, continue to be opposed to it, and recommend that it be repealed. Such action would greatly and immediately stimulate business and industrial activity to an extent that would more than offset any loss of revenue the Government might sustain through such repeal. The experience of our industry under this tax fully warrants our attitude. The tax has obstructed development of new mining enterprises and the expansion of existing ones, and has discouraged the restoration of activities of properties which had suspended or curtailed operations.

Mining enterprises begin with prospecting, carried on by an individual or a small group, usually organized as a corporation. Perhaps years are spent in reaching a point where actual expenditure of considerable sums of capital are warranted by the developments which have taken place. When this point is reached, two courses are open: either the owners of the property, who have spent years of labor in bringing it to this stage, must in order to secure new capital, surrender a large equity in that which they have created themselves, or they must pour back into the enterprise earnings which are derived from operation. Frequently the corporation has agreed to pay for the property all or a portion of the proceeds over an extended period.

This brings about a situation where the undistributed profits tax is a tremendous obstacle. If this tax is continued in any form, a hardship will be worked upon those who have devoted their lives and efforts to the operation thus far. They are obliged to distribute the earnings as they accrue or pay a penalty tax upon any sum which they devote to payment for the property, to the purchase of plant and equipment, or to the development of the ore bodies which have been discovered. In the ordinary course of things, all of this is paid out of current earnings. Mining investors expect this to be done so as to bring their investment to a sound financial status as rapidly as possible, and expect to await income return until the proceeds of operations exceed current expenditure requirements.

We know definitely from experience under the present law that any tax upon undistributed profits is a real deterrent to investment in the mining industry, as well as a hardship upon those already engaged in it, who have made substantial efforts and sacrifice in the creation of present and potential wealth for the nation.

This is not a matter for argument as to income tax theory, but a practical situation which confronts the mining investor. The gravity of the situation is being manifested in concrete form in published reports of mining companies to their stockholders for the year 1937, in which they set out the deferment or abandonment of plans to satisfy financial obligations or to expand their operations as a result of the undistributed profits tax.

Second, as to those years to which it may be applicable, we urge that you grant relief from the undistributed profits tax as to certain provisions which experience has demonstrated produce hardship or injustice; specifically

(a) As to sinking funds set aside in the normal course of business after the close of the taxable year.

The provisions of Sec. 26(c)(2) of the present law, which permit deduction in computing the undistributed profits tax only as to sinking funds set aside prior to the close of the taxable year, practically nullify the relief which this paragraph was designed to afford. The normal and usual corporate practice is to set aside such funds following the close of the year, after the earnings have been determined. We urge that all earnings of a taxable year allocated to sinking fund requirements within the next succeeding taxable year be accorded the same treatment as those now covered by Sec. 26(c)(2) of the existing law.

(b) As to the allowance of a reasonable period following assessment of a deficiency within which distribution of dividends may be made as a dividends paid credit.

The necessity for such a provision arises from the fact that determinations by the Commissioner of net income in excess of that computed by the taxpayer are usually not made until long after the close of the taxable year. The present law provides that dividends, to receive credit in the computation of undistributed profits tax, must be paid *before* the close of the taxable year. The taxpayer should be permitted to make an additional dividend distribution corresponding to the amount of any additional adjusted net income subsequently determined by the Commissioner, and to receive credit therefor.

This question was presented before the Committee on Ways and Means of the House by Mr. E. C. Alvord (see Record of Hearings on "Revision of Revenue Laws, 1938," page 488), in which he stated in part: " * * * Obviously it is grossly unfair to penalize corporations which attempted to distribute all their income in 1936 and 1937 for errors subsequently discovered in the return. An amendment

should be adopted providing that there shall be no retroactive surtax if the profits thus revealed are promptly distributed."

Later in the hearings (page 538) Mr. Vinson, Chairman of the Sub-Committee whose recommendations were under discussion, referring to this particular recommendation, stated that as he recalled it there was unanimous agreement on the part of the Sub-Committee to include that very thing in their recommendations and that he was glad Mr. Alvord had called it to their attention because otherwise it might have been omitted.

We cannot, of course, say whether the failure to include this provision in the bill was simply inadvertence, but we cite this record of the hearings as indicating that the Sub-Committee had been in agreement as to the proposal which we are now urging upon you.

(c) As to expenditures for construction, equipment and development or for payment of indebtedness not otherwise provided for.

Many corporations have been so situated that it has been impossible for them to do otherwise than apply all or a substantial amount of their earnings to construction, equipment and development of their properties or for payment of indebtedness not allowable as deductions in computing adjusted net income. These have been essential expenditures to permit them to continue to function and were necessary incidents to their earning the income which is the subject matter of this tax. We urge that amendment be made to the Revenue Act of 1936 to allow such expenditures as deductions in computing adjusted net income subject to the undistributed profits tax at least to the extent of 30 percent of the net income.

(d) We also wish to protest against the amendment made by the House to Section 26 (b) of the existing law, by which the 85 percent credit for dividends received is limited to an amount not in excess of 85 percent of the adjusted net income.

The effect of this limitation is to reduce the amount of the credit for dividends received by parent corporations which sustain a loss from their own operations. Thus an increasingly heavy effective rate is levied upon losing corporations least able to bear it. This is palpably inequitable and should be removed by deletion of the words "or not in excess of 85 percent of the adjusted net income," from lines 5 and 6, page 46, of H. R. 9682.

Third, we urge a provision for the carrying forward of losses of at least two preceding years as a deduction from the current year's income.

Previous revenue acts have provided for a two-year carry-over of losses. In the inherent uncertainties of mining operation it is very essential that there be guarding provisions in the law which will permit the managements of properties to meet the unfavorable operating conditions which often develop. Mining enterprises frequently carry on for several years without profits in the anticipation of subsequent earning capacity and it is inequitable to place limitations which exclude operating or development losses over such a period as a proper cost to apply against earnings when made.

Mining operations must be continuous or the company is subjected to heavy cost to maintain its plant and workings. The maintenance of the mining operation over a period of low prices and consequent loss is the only thing that makes it possible to keep the organization together and to be prepared to supply essential minerals when required. The action of mining organizations in providing employment through unfavorable periods should not be penalized by disallowing losses then incurred as a charge against subsequent earnings.

JULIAN D. CONOVER

Fourth, we urge that you eliminate the present complicated provisions for recognition of capital gains and losses and return to a flat rate of 12½ percent, applying this to the net gain realized from the sale of capital assets held for more than one year.

The present high and graduated rates of tax on capital gains discourage investment. Capital is available for productive enterprise only when investors can acquire assets with opportunity to diversify or otherwise change their holdings without sacrificing their capital through taxation. Because of the inherently great risk in mining enterprises this is especially applicable to investments in our industry. On the other hand a reasonable fixed rate of tax on capital gains would immediately stimulate the flow of capital which is urgently needed for the continued upbuilding of our industry.

The Government derives no revenue from capital gain transactions which never take place. Revenue from such transactions is obtained only under a rate of tax which will not discourage the sale or exchange of capital assets. A flat rate of 12½ percent would produce substantially larger revenue than the rates contained in the pending bill.

As a permanent policy we believe that any limitation on the deductibility of capital losses against ordinary income is not justified. If, however, under present revenue demands, it is not deemed practical to allow full deduction of capital losses, we urge a provision which will allow a carry-over of net capital losses for a two-year period.

Certainly, there should be no further limitation upon the allowance of capital losses, such as is provided in Secs. 23(g) —2 and —3 and Secs. 23 (k) —2 and —3. Losses sustained as a result of the worthlessness of securities have always been considered ordinary losses. The investor cannot control the period in which this class of loss is determined, and should be allowed full deduction therefor.

Fifth, we urge that a new declaration of value of capital stock for purposes of capital stock and excess profits taxes be allowed in 1938 instead of 1939, and that redeclarations of value be permitted thereafter every two years instead of every three years as provided in the House Bill.

We are deeply gratified that the necessity for periodic redeclarations of value has been recognized in the House Bill. We submit, however, that such redeclarations should be allowed at intervals of not more than two years. In mining properties in the development stage, the conditions which determine value vary greatly from year to year and frequent redeclarations are necessary to avoid hardship and injustice. Even in established operating mines, good mining practice limits the development of the mineral deposit to approximately two years in advance of current operations, and a two-year redeclaration period is the minimum which will give adequate recognition to those physical facts which determine the value and earning power of the property.

The numerous adjustments required by law in these declarations are complicated and are on various bases, some on bases which bear no possible relation to the basis of the original declaration. In former years, when frequent redeclarations were permitted, the tax yielded substantial revenues with a minimum of administrative difficulty or legal contests. We believe it will continue its substantial revenue yield if redeclaration is permitted every two years.

The first declaration under the 1938 Act should be in 1938, in accordance with the established practice of allowing a new declaration under each general revision of the Revenue Act.

Sixth, we urge that losses due to obsolescence be recognized in full.

The pending bill would make a change in Sec. 117(a)(1) in the definition of capital assets to exclude from that definition "property, used in the trade or business, of a character which is subject to the allowance for depreciation provided in section 23(1)." The reason which is stated in the House Committee's report (H. R. Report No. 1860, page 34) seems to be to provide particularly for full loss due to obsolescence in a case such as is there cited, of a machine which had become obsolete and was removed and sold for its second-hand value in order to provide for installation of a new and improved type of machine. The statement is made in the Committee's report that under present law the loss thus sustained on sale of the obsolete machine might be largely disallowed because of the provisions of the present Sec. 117(d).

We believe that this is an erroneous statement of the situation under existing law. The Revenue Act of 1934, which first introduced the provisions of Sec. 117, continued without change the prior provisions with respect to allowance of loss due to obsolescence, retirement of obsolete property, etc. This has been continuously recognized under the Treasury Regulations (e.g., Treasury Regulations 94, Art. 23(e) —2 and —3). These contain the definite statements that the limitations of Sec. 117 with respect to sale or exchange of capital assets have no application to losses due to discarding of capital assets. We urge that this is the proper interpretation of present law, and that no amendment should be made with any contrary explanation.

We approve of any desirable amendment which will place beyond question the intent of the law in this regard. We would subscribe to an amendment to Sec. 117 which would state specifically that the limitations of this section are not applicable to deduction for loss due to obsolescence of depreciable property. We urge that the Committee report in connection with such an amendment should make clear that its sole purpose is to express the proper intention of prior acts.

Seventh, we urge that recognition be given, in the provisions dealing with inventories, to the established practice in the mining and metallurgical industry of balancing current sales against current purchases or intake, through recognition of what is known as the "last in, first out" method.

This is a problem of specific application to our industry which will be presented in detail by our next witness, Mr. D. A. Callahan.

We also respectfully invite your attention to the statement of the American Mining Congress submitted to the Committee on Ways and Means of the House of Representatives on January 22, which appears at page 886 of the record of that Committee's hearings.

We believe that favorable action on the amendments which we have urged will do much to revive business activity, to release much needed capital for productive enterprise, to create increased employment, and to provide increased revenue for the Government.

STATEMENT of DONALD A. CALLAHAN

Vice President, American Mining Congress In Appearance before Committee on Finance, United States Senate, March 21, 1938

I AM appearing here in behalf of the American Mining Congress to urge an amendment to Section 22 (c) of the bill. In doing so I am representing the entire industry from the producer to the fabricator of metal products.

This provision which is a repetition of the present law, confers upon the Commissioner of Internal Revenue the authority of prescribing the basis of inventories which will clearly determine the income of a taxpayer. Under this law the Treasury Department refuses to permit those engaged in the metal smelting, refining and fabricating industries to apply current costs to current sales in determining the cost of goods sold. The American Mining Congress urges that this section be amended to permit these industries to use this method.

DONALD A. CALLAHAN

This method has been recognized as best accounting by the industries themselves for reporting to stockholders, for paying dividends and for all other corporate purposes. It has been approved by leaders in accounting professions, by the Securities and Exchange Commission and by the Treasury Department, itself, for silver tax purposes.

Metallurgical improvements over the past several years have resulted in the final production of a practically pure form of metal. These processes consume a considerable period of time and during this period the smelter and refiner must carry large inventories because the smelting and refining business is a continuous process and must not be impeded or delayed by lack of metal in the form of concentrates, and the smelting and refining company must carry stocks of refined metal to meet the demands of the market.

Basically, smelting and refining is a custom business and a substantial part of present day operations are conducted on a direct toll basis. Obviously, however, the small producer of crude ores is not financially able to carry the metals through the smelting and refining period. Accordingly, a substantial part of the business must be conducted on what is known as the ore purchase contract basis.

In these cases the producing company makes a contract with a smelting company under the terms of which settlements are made upon the basis of the market price on the day the concentrates are shipped to or received by the smelter. By sampling and assay the exact refined metal content of the concentrates is determined at the time of delivery and the producer is then paid the market price

for the refined metal equivalent of his product, less a specified charge for smelting and refining.

Experience has taught the custom smelter and refiner that he cannot afford to speculate on metal price fluctuations. The risk of loss is too great, the processing period is too long, metal prices are subject to extreme and rapid fluctuations. A large part of the price of the refined metals represents the cost of the crude ores. There is no adequate metal futures market for hedging.

Accordingly, the custom smelter and refiner protects himself by selling, concurrently with the purchase of crude ores, an amount of refined metal equivalent to the metal content of the ore purchased. The price paid for the metals in the ores is thereby matched with the price received for the refined metals. The effect of subsequent fluctuations in metal prices is neutralized, the smelting and refining fee charged the producer is protected and the profits from operations on the purchase contract basis coincide with those derived from toll operations. This, of course, can not be carried out with absolute mathematical exactness, but it is the basic buying and selling policy of the industry, and in ordinary times it can be and is carried out with remarkable accuracy. This accuracy results from two factors: (1) close cooperation between the receiving and selling departments and (2) the ability to determine the exact refined metal content of the crude ore or concentrates. This second factor is essential to a matching policy and distinguishes the metal process industries from the ordinary manufacturers who do not and can not employ it.

Notwithstanding the fact that the custom smelter and refiner conducts his business so as to eliminate the risks of market fluctuations, he is obliged under the present rules of the Internal Revenue Bureau to reflect such fluctuations in the computation of his taxable net income. This result is produced, because he is not permitted to apply the cost of current purchases against current sales, which conforms to the basis of conducting his business, but is obliged to apply the so-called "first-in, first-out" rule in determining the cost of goods sold. This latter rule assumes that the raw materials purchased first are used first and correspondingly, that those purchased last are used last.

This rule can not fairly be applied to the smelting and refining industry, because in order to operate efficiently the custom smelter and refiner must maintain a substantial amount of stocks on hand. The first-in, first-out rule goes back through the entire inventory, picks up the cost of the earliest purchase and applies it to the present sale. As a result, the entire net fluctuations in market prices since the date of the earliest purchase, which was probably several months before, is reflected as profit or loss on each sale of refined metals—although from the business point of view, the sale is made for the very purpose of eliminating the effect of such fluctuations. This introduces a speculative element into the computation of the taxable income which is wholly absent in the conduct of the business.

The method of matching current sales against current purchases has desirable results for both the producer and the processor. It assures the processor of his operating profit or toll and enables him to pay the producer upon delivery of his metal to the smelter. It also assures the producer of a market free from the speculative element which would result if the smelter purchased his metals and held them for future sales. So long as this practice is followed, the method of accounting employed by the smelter and refiner should conform thereto and taxable net income should be based upon such method.

Wheels of Government

(*Continued from page* 41)

and zinc. On the same day Representatives James G. Scrugham of Nevada and Abe Murdock of Utah, personally presented a protest signed by 16 members of Congress from mining states, shown in full on page 50, to Harry C. Hawkins, Chief, Division of Trade Agreements, Department of State. It is now anticipated that the United Kingdom Agreement will be completed and proclaimed about June 1 or shortly thereafter, and as the protest of the metal and mineral producing industries has been the strongest of any that have been registered, it is greatly hoped that the State Department will not increase unemployment in the mining regions and jeopardize the supply of needed materials, in the event of a national emergency, by reducing duties on these important commodities.

Bituminous Coal Commission

On Friday, February 25, at 11.59 P. M. all minimum coal prices and marketing rules and regulations established by the National Bituminous Coal Commission under the Guffey Act were revoked. The action was taken as a direct result of court injunctions granted to railroads, municipalities and other groups which had protested the price schedules. The commission has since begun the work of assembling data upon which to fix new prices, a work which is expected to take several months. In the meantime, Commission Chairman C. S. Hosford, Jr., has resigned, effective April 1, and the opinion is expressed by many that the National Bituminous Coal Act, as written, cannot be made to function. Many coal companies have again turned to the marketing agencies made lawful by the Supreme Court decision in the case of Appalachian Coals Incorporated. Under this treatment there is a self discipline in the industry through the acceptance of marketing regulation by the member companies. There are some advocates of a complete fact-finding set-up to cover production, distribution and sales activity with full publicity to be made available every 90 days. It may be that this type of treatment could be accomplished under the existing law, with the commission empowered to rule on differences arising between the several marketing agencies; if not under the Commission, the various marketing agencies might enter into an agreement to arbitrate matters upon which they are unable to agree in the normal course of their work.

Marketing Agency for Northern West Virginia

A group of northern West Virginia coal operators met in Fairmont, W. Va., March 8, and voted unanimously to proceed with preliminary steps for incorporating and establishing a regional marketing agency. The operators in attendance represented approximately 70 percent of the commercial tonnage of the district.

In line with the resolution adopted by the operators, a committee consisting of T. L. Michie, Jr., Pittsburgh, attorney for the Koppers Coal Company; Tusca Morris, attorney for the Consolidation Coal Company, and Frank R. Amos, attorney for the Bituminous Coal Producers' Board for District 3, were scheduled to meet in Washington with the National Bituminous Coal Commission a few days later to discuss the general plan presented at the meeting.

Mining Congressmen Oppose LEAD-ZINC DUTY Reduction

• *Statement Presented Personally to H. C. Hawkins, Chief, Division of Trade Agreements, Department of State, by Representatives J. G. Scrugham (Nevada) and Abe Murdock (Utah), on March 15.*

HON. CORDELL HULL,
Secretary of State,
Washington, D. C.

DEAR SIR:

The undersigned Representatives in Congress from districts wherein lead and zinc are produced or processed submit the following statement for your consideration:

Reduction of tariff rates contemplated in the trade negotiations now taking place with Great Britain and her Colonies and with the Dominion of Canada will unquestionably seriously affect not only the lead and zinc mining industry itself, but other industries dependent upon it.

The present tariffs on lead and zinc are not high. They have been in effect since 1922. They represent only a sufficient protection to permit the development and production of ores from the mines in this country. That protection is needed to cover the differences in cost of production and to insure a continuous operation of mining properties.

Mining is a peculiar industry. It cannot be shut down and reopened without greater loss than would occur in any other industry. Mine workings fill up with water; they cave in; their timbers rot; and after a period of inactivity they become practically inaccessible. The only way to insure a supply of the base metals is to have continuous operation, continuous development, and continuous exploration.

Mining also depends upon research. Geological formations must be studied; new metallurgical processes must be developed. Ores which a few years ago were deemed worthless are now valuable simply because research has discovered new methods of making them available to use.

This kind of business cannot be carried on without assurance of profits; not ordinary profits which will compensate for tremendous risks which are necessary to be taken. It is an industry which must be stabilized, and we cannot expect capital to be invested or men to devote their lives to study of its peculiar conditions unless there is a practical guarantee that such investments and such labors will not be subject to unnecessary dislocations.

Lead and zinc mining furnishes employment in more than 20 States in the Union, and the processing of lead and zinc furnishes employment in many more. Lead and zinc are mined on the Atlantic Coast, in the middle States and in the Rocky Mountains. Mining and processing of ores pays good wages, and American mining companies pay the highest wages in the world.

Lead and zinc are necessary to national defense. There must be a constant and uninterrupted search for these metals, and research to develop processes which will make them more valuable and more available to use. From a military standpoint alone, the United States cannot permit interest in the search for and development of nonferrous metals to lag.

The United States cannot compete with its own neighbors in the production of lead and zinc. To the north in Canada we have the most stupendous deposit of lead and zinc ever discovered in the world. A rich deposit which can be mined and sold on the world market at a price approximately the cost of the production of these metals in the United States and still yield a handsome profit. In 1936 this mine produced one-third as much lead as all the mines in the United States, and it has a zinc production equal to 30 percent of the entire production of the United States.

To the south of us our neighbor, Mexico, which would share in the benefit of tariff reduction under the most-favored-nation principle, produces lead and zinc at a cost which would drive out of our own market all of our local producers.

Much has been said recently about restoring prices to the level of 1926. The lead price of today equals only about 50 percent of the average prices during 1926. The zinc price does not exceed 60 percent of the 1926 average.

In the matter of wages, these have constantly increased and are much higher than they were in 1926. Comparison of wages shows Australia paying $3.10 per shift; Mexico, $1.00 to $1.25; while the United States' average is better than $5.50 a shift.

Mining is carried on to a great extent in isolated communities which depend entirely upon income from that source. Reduce the tariff, permit foreign ores to take the place of our American products, and you will destroy self-contained communities, put thousands of families on the relief rolls and cripple an industry necessary to future commercial progress of our country and to national defense as well.

We submit this statement on behalf of the men and women of our States who depend upon the continuous operation of our mines and smelters; we present it upon behalf of the thousands who depend indirectly upon the payrolls of our mining communities; we present it upon behalf of the communities, cities, counties and States which derive large sums in taxes upon the properties and plants now in operation and we present it upon behalf of the Federal Government itself, which would be deprived of income taxes from profitable businesses and would be forced to pay out great sums in unemployment relief if our mining industry should be curtailed. And we submit that no foreign market for American products can compensate for the loss of our markets among our own workmen. We are willing to help promote world peace, but we want also peace at home among contented American workers, assured of steady employment at good wages.

We do not believe that in the negotiations with Canada and Great Britain you contemplate reducing tariffs which will result in destruction of the basic American industries. We cannot believe that there is any thought of reducing the tariff rates on zinc and lead which have never been high and are not high now, in order, perhaps, to promote the sale in other countries of either manufactured or agricultural products. We are presenting here the case of a basic American industry, one which must continue, not only in production but in development, exploration and research as well. We submit to you the necessity of retaining the present tariff duties on these essential products.

(Signed)

J. G. SCRUGHAM, Nevada,
COMPTON I. WHITE, Idaho,
JOHN R. MURDOCK, Arizona,
FRED CUMMINGS, 2nd District, Colorado,
LAWRENCE LEWIS, 1st District, Colorado,
ABE MURDOCK, 1st District, Utah,
D. WORTH CLARK, Idaho,
JOHN J. DEMPSEY, New Mexico,
JOHN MARTIN, Colorado,
EDWARD T. TAYLOR, Colorado,
JERRY J. O'CONNELL, Montana,
JAMES F. O'CONNER, Montana,
CLYDE WILLIAMS, Missouri,
WESLEY E. DISNEY, Oklahoma,
CHARLES H. LEAVY, Washington,
J. WILL ROBINSON, Utah.

NEWS and VIEWS

Zinc Institute Meeting

The twentieth annual meeting of the American Zinc Institute will be held at the Hotel Statler, St. Louis, Mo., on Monday and Tuesday, April 25-26, according to an announcement by Ernest V. Gent, Secretary of the Institute.

On Monday there will be a report of the Institute's activity during the last year, including a novel close-up of the Institute's promotion work. Happenings in Washington, and the outlook for zinc, are other topics to be featured. The program on Tuesday will include topics relating to developments in zinc coatings and the market for zinc coated products.

The fourth meeting of the Galvanizers Committee will be held in conjunction with the Zinc Institute meeting, but will extend for one more day. The Tuesday morning session will be devoted to subjects of joint interest to the Galvanizers Committee and the zinc industry, while those to be discussed Tuesday afternoon will be of principal importance to the galvanizers. On Wednesday morning there will be a second closed session for the members of the Galvanizers Committee, and an inspection trip to a zinc smelter has been arranged for that afternoon. Mr. F. G. White is chairman of the Galvanizers Committee.

Entertainment features at the joint meeting will include the annual dinner on Monday evening, at which Branch Rickey, manager of the St. Louis Cardinals, will be one of the guest speakers; and an informal smoker and get-together for the Galvanizers Committee on Tuesday evening.

Operations Started by New Coal Company

The Elk Creek Coal Company, a new concern located near Pemmett, W. Va., with a 2,000-ton daily production, has begun to operate, according to a recent announcement by J. R. Fields, general manager. The operation will eventually employ about 150 men. The new operation is affiliated with the Guyan Eagle Coal Company, the Buffalo-Chilton Company, and the Winisle Coal Corporation, full supervision over all of which is in the hands of Mr. Fields. These mines will have a combined annual production of about 1,750,000 tons of coal, putting them in third place for coal tonnage in the Logan field.

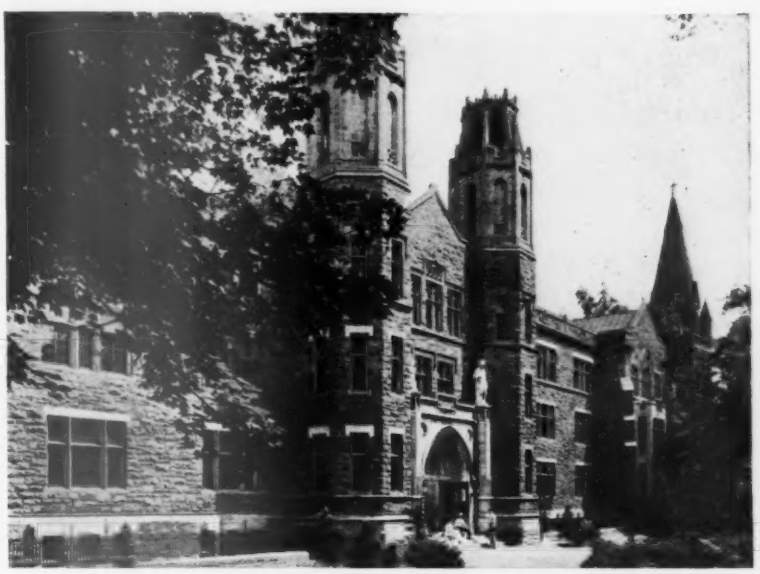
Others interested in the new organization, which has not been incorporated, are John A. Kelly and Dr. H. D. Hatfield.

Anthracite Conference at Lehigh

The growing tendency of education to become the practical ally of business was further indicated by the recent announcement of Dr. C. C. Williams, president of Lehigh University, of the first Anthracite Conference which will be held under University auspices on April 29 and 30. The purpose of this conference, which is expected to become an annual affair, is to survey recent engineering developments in the mining and utilization of anthracite and to bring engineers, educators, members of the industry and the general public up to date on the rapid technological progress in Pennsylvania's hard coal industry.

Conference Chairman, Dr. Herman Eckfeldt, professor of Mining Engineering at Lehigh, has arranged for 18 technical papers to be presented at the conference. These will focus interest and consideration of engineers, educators, and the industry's selling forces on the rapid engineering progress being made in production, distribution, automatic burning and consumer economy of anthracite. Additional reports of the utilization of ash, and the non-fuel uses of anthracite will also be included in the two-day discussion.

According to Dr. Eckfeldt, invitations will be extended to the engineering faculties of all universities in the country in addition to industrial engineers, architects, equipment manufacturers and those industries allied to anthracite.



Packard Laboratory of the Lehigh School of Engineering—where conference will be held

Papers will be presented by outstanding authorities on the various subjects covered, and at the conclusion of the conference the 18 papers will be published in a single report which will be made available for general reference.

Major subjects to be discussed in the program embrace the following: "Inherent Characteristics of Anthracite," "Combustion Characteristics of Anthracite," "Description of the Combustion and Operation of Anthracite Burning Equipment," "Some Aspects of the Commercial Application of Anthracite," and "The Merchandising and Civic Values of Anthracite."

Tamarack & Custer Exploration

Exploration of the Chesapeake vein on the 1,500-level of Tamarack & Custer Consolidated Mining Company's property in the Coeur d'Alene, Idaho, district substantially increased the company's ore reserves in 1937, and further development of the ore body on the new 1,650-level is planned for 1938, according to the annual report of Henry L. Day, of Wallace, Idaho, manager. He says, however, that with both lead and zinc at 4.5 cents per pound, the property cannot be operated at a profit. Production, therefore, is being confined to the ore obtained from development, and no stoping is contemplated until conditions improve. In 1937 ore concentrated amounted to 21,634 tons, of which only about one-fifth was produced by stoping. Gross content of the 1937 production was 45,236 ounces of silver, 2,653,010 pounds of lead, and 3,818,648 pounds of recoverable zinc. He reports a net profit of $13,582 in 1937, after deductions. Jerome J. Day, of Wallace, Idaho, is president.

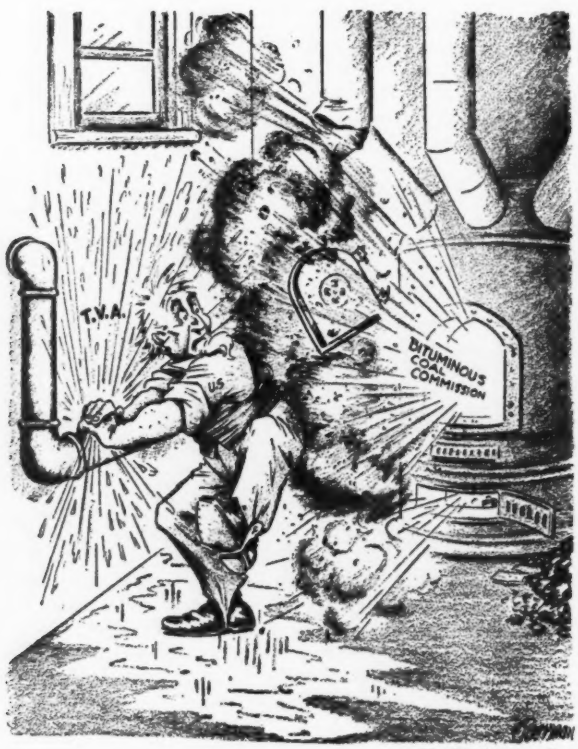
Short Wave Radio for Mine Communication

What is claimed to be the first known experiments in short wave radio communications in a coal mine were made at the Buck Mountain Colliery of Coxe Brothers and Company near Wilkes-Barre, Pa., by Jan Forman, English radio expert, early in February. Working with officials of the company, Forman endeavored to prove the value of this type of communication for underground work, which, if successful, would eliminate necessity for telephone lines underground, and be particularly valuable in times of emergency.

The apparatus is simple and light, comprising a French telephone mouth and ear-piece and a small, light battery box which may be strapped to the hip of the operator. Although the experiments are still in a preliminary stage, it was stated that the recent tests have strongly indicated that the apparatus may have a wide practical use.

Fire Destroys River View Tipple

The coal tipple of the River View Coal Mining Company, at Coalburg, W. Va., was destroyed by a fire of undetermined origin on March 1. Loss was estimated at $50,000 by the office of Carel Robinson, manager of the Kelleys Creek Collieries, at Ward. So quickly did the flames spread that efforts to fight the fire were fruitless, according to K. W. McCartney, manager of the company's store. The tipple served the one mine of the company, a subsidiary of Valley Camp Colliery. M. M. Lilly is mine superintendent.



—The Washington Post.

Domestic Problems

Anthracite Discussed by Merritt

Flat denial that there is any "semblance of monopoly" or any of the symptoms of monopoly, in the anthracite industry, and the assertion that estimated net losses of the producers in 1937 were between $25,000,000 and $30,000,000, marked the address of Walter Gordon Merritt, counsel for the Anthracite Institute, before the Pennsylvania State Chamber of Commerce February 17.

After citing the importance of anthracite in the industrial life of Pennsylvania, Mr. Merritt concluded by enumerating eight things that the Commonwealth might do to promote the recovery of this business in the interest of workers and investors, and as a source of tax revenue. They were:

1. Accord the industry the same degree of law protection it extends to other people and other industries.
2. Reduce tax burdens and influence local communities to economize expenditures until the present crisis is over.

3. Stop maligning the industry and accusing it of monopoly, when the entire industry is near ruin from competition within and without.
4. Cease accusing the industry of not trying to sell its product when it is spending millions in promotional work.
5. Tell workers in the industry that the new amendment of the Workmen's Compensation Law, imposing an added $5,000,000 charge annually on the industry, will prove a boomerang resulting in a further loss of markets and hence jobs; and repeal this legislation.
6. Urge the United Mine Workers to study ways and means of reducing wage rates as a means of increasing workers' earnings.
7. Continue its aid in the effort to reduce freight rates.
8. Appeal to the Department of State for the elimination of the Canadian duty on Pennsylvania anthracite and an adequate duty on imported anthracite; and demand a Federal tax on fuel oil.

After discussing the stolen coal situation, Mr. Merritt reviewed the plans of the Lauck Commission and others for control of one kind or another for the anthracite industry. He said the only plan which has both the backing of the United Mine Workers and a substantial percentage of the industry has been one to create a Federal commission, similar to the National Bituminous Coal Commission, to fix minimum mine prices—and possibly maximum ones—prescribe marketing rules and prohibit unfair methods of competition.

"The tragic part of this picture is the complete confusion and lack of direction which characterizes the situation after years of study and expenditure," said the speaker in concluding. "The public and public officials are being mislead by radicals and visionaries who wish to try out their theories of radical experimentation. The real facts they will not emphasize. The homely practical truths are unspoken. They are still feeding the public outmoded charges of monopoly and promises of lower consumer prices, when monopoly is nothing but a political phantom, and lower prices are not economically practicable under any condition now in sight."

Silicosis Film

Continuing its efforts to aid in the prevention of silicosis, the United States Department of Labor has released a motion picture depicting the harmful effects of the disease, the methods by which it may be prevented and a plea to workers, employers, and the general public to cooperate in the battle against this industrial illness.

Accompanied by sound effects and an explanation of what is portrayed, the picture, entitled "The Story of Silicosis," is of one-reel length. It is being produced under the direction of R. Campbell Starr, secretary of the National Silicosis Conference and a member of the Labor Department staff.

Bill for Mine Station at Salt Lake City Signed

The bill to provide for the construction and equipment of a building for the Experimental Station of the Bureau of Mines at Salt Lake City, Utah, final action on which has been pending in Congress for more than two years, has finally been passed and was signed by the President, February 25. The new building is to be constructed and equipped at a cost not to exceed $300,000, and will be erected on a plot of ground adjacent to the University of Utah on the Fort Douglas side. This land was donated to the University by the Federal Government a number of years ago, and the University will return part of it for the new Mines Station. This action was authorized by the 1937 State Legislature.

Appalachian Coals to Market Southern High Volatile

Increased interest in the marketing agency plan of selling coal, which interest has been growing since the National Bituminous Coal Commission suspended its minimum price schedules, culminated March 8 in a decision by a majority of Southern high volatile operators to market their production through Appalachian Coals, Inc., pioneer regional sales agency. The producers had been in session two days attending conferences that preceded the annual meeting of Appalachian stockholders.

Operators from the eight producing districts of the Southern high volatile field agreed to "prevent a prolonged price war" by selling most of their tonnage (74,786,375 tons in 1937) through the A. C. I. agency. As a result, Appalachian will represent at least 54,000,000 tons or 72 percent of the entire tonnage. Operators representing this percentage of the tonnage recently signed contracts with the agency or pledged their companies to sign contracts naming Appalachian Coals, Inc., as their exclusive sales agent. Producers attending the conferences stated that ultimately 75 to 85 percent of the tonnage might be sold through the agency.

1937 Shipments of Lake Superior Iron Ore

Final figures of Lake Superior iron ore shipments from mines during 1937, recently released by the Lake Superior Iron Ore Association, reveal that 62,522,959 gross tons were shipped from mines to Upper Lake ports, with 587,281 gross tons additional having gone "all rail," making a grand total of 63,110,240 gross tons.

The Mesabi shipped 45,823,571 tons, or about 72 percent of the total; Marquette 5,747,812, or about 9 percent; the Gogebic, 5,661,270, or about 9 percent; and the remainder coming from the Menominee, Vermilion, and Cuyuna Ranges.

Red Parrot Safety Banquet

Two hundred employes of the Red Parrot Coal Company, of Prenter, Boone County, West Virginia, gathered at the Daniel Boone Hotel in Charleston, March 12, for their annual safety banquet. The company has good cause to celebrate their safety record, inasmuch as not a single fatality has marred the company's record since 1935, and the operation now has produced 1,750,000 tons without a loss of life, according to John T. Syndor, general manager.

Congratulations to the company and employes were extended by a number of State officials, including Governor Holt; A. G. Mathews, Compensation Commissioner; Burr Simpson, Road Commissioner; N. P. Rhinehart, Chief of the Department of Mines, and Dr. G. C. Schoolfield, Chief Medical Examiner for the Compensation Department.

Option on Georgia Gold Mine

A large mining corporation of Boston, Mass., has taken an option at a substantial figure on the Royal-Vindicator Gold Mine located near Tallapoosa, Ga. Work will be started at

once to unwater the mine, which was operated on an extensive scale some 40 years ago. Dr. Marshall Haney, a mining engineer of Geer, Va., handled the negotiations.

Jack Waite Operations Profitable

American Smelting and Refining Company has been carrying on the operations of the Jack Waite mine on a profitable basis during 1937, according to the annual statement of J. F. Duthie, president of the Jack Waite Company. Development work to the amount of $22,142 was done during the year, the purpose being to create new ore areas, to permit more efficient operations. During the year the company's liability to the A. S. & R. was reduced by $86,177, and the company announced a special dividend of 1½ cents per share, payable February 21. During the year 57,261 tons of ore were mined. Shipments consisted of 5,213 tons of lead concentrates, 1,442 tons of zinc concentrates and 1,939 tons of crude lead ore.

This company's property is 10 miles northeast of Murray, Idaho, and lies across the Bitter Root Mountains divide between Idaho and Montana. A tunnel more than 7,000 ft. long extends from one state to the other.

Monitor Haulage

(*Continued from page* 14)

emergency, thereby obtaining quicker setting of the auxiliary brake.

4. By pressing the foot operated push button and reversing the master switch, the motor may be "plugged" to stop the load.

5. During "plugging," the auxiliary brake is released. By tripping the toggle, the mechanical braking effect is added to the "plugging" action, giving emergency braking effort. The "plugging" control should never be resorted to except in an emergency.

6. Pushing forward on the auxiliary brake lever with the toggle tripped applies additional braking effort.

7. Overload and undervoltage protection are furnished as a part of the control panel. The timing relays are adjusted at the factory and should require no further adjustment.

Credit is due Mr. W. J. Heacock, electrical engineer, Link-Belt Company, for working out the electrical details for this installation.

COAL COMMISSION DEVELOPMENTS

THE serious conditions prevailing within the National Bituminous Coal Commission were brought further into the limelight March 16 when a majority of the Commission in the absence of Chairman Charles F. Hosford, Jr., voted to abolish its five-man publicity division. At the same time, the Commission voted to transfer the functions of that division to the office of the secretary of the Commission. It is expected that two or more assistants will be appointed to the secretary's office for the purpose of handling the publicity machinery of the agency.

This event is the latest step in the controversy within the Commission over patronage questions. Rumors of bickering and dissension among members of the Commission have been rife for many months and the present situation has been likened to that now existing in Tennessee Valley Authority.

This latest step followed closely upon the heels of a statement by Senator Joseph E. Guffey of Pennsylvania on Monday, March 14, announcing the resignation of Charles F. Hosford, Jr., as chairman of the Coal Commission, and its acceptance effective as of April 30, 1938. Guffey's announcement was made after he had visited the President and apprized him of the resignation. Reliable sources indicate that President Roosevelt asked Hosford to remain although it is publicly known that the Commission chairman is anxious to leave before that date for personal reasons.

At this writing, there are a great number of rumors flying about Washington with respect to whom Hosford's successor on the Commission may be. Foremost among these are reports that Walter A. Jones, Pittsburgh oil man and a staunch member of the Democratic party, is the choice of Senator Guffey and John L. Lewis for the vacancy. This speculative rumor may have little basis as some Washington sources have forecast that if Mr. Jones' name was offered, he personally might not accept a place on the Commission.

Reports emanating from sources close to Hosford indicate that he never intended to remain with the Commission for the full term and resigned in order to return to active law practice in Pennsylvania. It is understood that he wished to step down in order that another member might be chosen before the Commission undertook the formulation of a new schedule of coal prices.

Still another report prevailing in the Capital City was that Senator Guffey and John L. Lewis were supporting Pleas E. Greenlea for the chairmanship of the Commission. Greenlea is a former political associate of Paul McNutt in Indiana and is at present a member of the Commission. Pending final action the Commission has elected Percy Tetlow as Acting Chairman.

Meanwhile, the Commission has exempted soft coal production of the state of North Carolina from the Bituminous Coal Act of 1937. This is the first state to be exempted from the provisions of the Act. The Commission has also ruled that all coal mined and consumed within the state of New Mexico is in direct competition with coals moved in interstate commerce from within and without the state and therefore subject to provisions of the 1937 Coal Act. Regulation of intrastate coal in New Mexico becomes effective April 15.

Latest steps in the Commission's procedure toward the reestablishment of new minimum prices and marketing rules and regulations were (1) an order issued on March 16 calling upon each code member to forward by April 15 replies to questionnaires sent out by the Commission concerning coal analysis and preparation, methods of mining, and other data to be used by it in its renewed efforts toward stabilization of the industry; and (2) an order released March 23 for all district operators' boards to send representatives to Washington March 30 to discuss procedure for establishing new minimum soft coal prices.

Meeting of Smokeless Coal Operators

A meeting of the Smokeless Coal Operators Association was held March 9 at White Sulphur Springs, W. Va., in conjunction with a general meeting of Board No. 7. A new set of officers for the coming year was elected, as follows:

Frank A. Taylor, Maryland Coal and Coke Company, president; Herman D. Everett, first vice president; John J. Atwater, second vice president; H. R. Hawthorne, treasurer, and Holly Stover, secretary.

Strong appeals for stabilization of prices were made by James D. Francis and Hugh Hawthorne.

Role of Minerals

(*Continued from page 36*)

measured by size of population has delayed recognition of the overwhelming concentration in a few states of real war power, under modern conditions, conferred by the control of mineral resources. It is simply impossible for the rest of the countries of the world, together, regardless of their great areas and population, to build up ultimate war power to more than a small fraction of the scale of the dominant group. The problem is how and if this power can be collectively used. As small as the group is, there are grave political difficulties in the way of harmonizing the highly varied national interests involved, which may be impossible to overcome except under the compelling psychology of war. In advance of war it is difficult to secure a popular mandate on a physical problem of this kind. Yet, a realistic view is that sooner or later war may have to be fought collectively by the "have" nations in defense of their material and idealogical positions. If this is true, is there not some way to use the great power in our hands to preserve world order, by force if necessary, in the hope that it will limit and deter aggression and that, like the police powers of the states, it will seldom require the ultimate use of force?

In urging consideration of this procedure I would like to make it clear that I am not attempting to formulate a panacea for war. My purpose is rather to call attention to the fact that events have brought minerals to the front as a leading cause of world unrest; that nature's distribution of mineral supplies confers immense potential power on a few nations; that in the not unlikely event of the failure of peaceful methods of war prevention, the use of this power by these few nations may be forced in self-defense, raising the question whether such power may not be used affirmatively and collectively to maintain order. The time is none too early for serious study of this question. Finally, I cannot too strongly emphasize my belief that the United States, because of its leading mineral position, will be inevitably involved, and, with the British Commonwealth, has the greatest responsibility for a wise solution of the problem.

Loading Committee Meeting

(*Continued from page 27*)

chine boom should be termed the "service locomotive." The term "relay locomotive" should be used where mines have what is commonly designated as "swing motor," "shuttle," etc., to deliver trips from the main haulage to the service locomotive. It was also suggested that the locomotive crew should be designated as motorman and brakeman—the term brakeman being adopted instead of snapper, trip rider, etc.

A review of the sample forms for the daily reports of the section foremen brought out the fact that some companies have these forms show the number of men on a unit crew and how they are employed, while other companies confined the reports to performance records, delays, supplies used, etc. It was the suggestion of the committee that the recommended form should have space to show the unit crew, but that the sheet should be so designed that the listing of the men employed could be optional.

In order to expedite their study, the subject of operating records was divided into three general classifications and the following sub-committees were appointed:

Subcommittee on Section Reports

E. W. Potter, Koppers Coal Company, Pittsburgh, was appointed chairman of this subcommittee, their study to cover the daily reports of the face or section foreman and a daily mine summary of the section reports.

Subcommittee on Mechanical Reports

S. M. Cassidy, Weirton Coal Company, was appointed chairman of this subcommittee, and their recommendation is to cover daily reports on loading machine maintenance and weekly machine inspection reports.

Subcommittee on Time Study Forms

W. R. Cuthbert, Pittsburgh Coal Company, was appointed chairman of this subcommittee, whose work will cover time study forms and analysis sheets for time studies.

Copies of the sample forms received from operating companies are to be used by the subcommittees as a basis for their studies. It was suggested that the subcommittee chairmen should have their recommendations completed by early April if possible, so that a meeting of the full committee can be called to consider these recommendations by about April 15.

Calling All Coal Men

(*Continued from page 45*)

National Carbide Co.
National Carbon Co., Inc.
National Electric Coil Co.
National Malleable & Steel Castings Co.
National Tube Co.
Nordberg Mfg. Co.
Ohio Brass Co.
Penn Machine Company.
Pennsylvania Electric Coil Corp.
Philco Radio & Television Corp.
Portable Lamp & Equipment Co.
Post-Glover Electric Co.
Princeton Foundry & Supply Co.
Productive Equipment Corp.
Frank Prox Co., Inc.
Pure Oil Co.
Roberts & Schaefer Co.
Robins Conveying Belt Co.
Robinson Ventilating Co.
John A. Roebling's Sons Co.
Safety Mining Co.
Sanford-Day Iron Works, Inc.
Scully Steel Products Co.
Shell Petroleum Corp.
Simplex Wire & Cable Co.
Socony-Vacuum Oil Co., Inc.
Standard Oil Co. (Indiana).
Stephens-Adamson Mfg. Co.
Sterling Pump Corp.
St. Louis Power Shovel Co.
Streeter-Amet Co.
Sullivan Machinery Co.
Sun Oil Company.
W. O. & M. W. Talcott, Inc.
Tamping Bag Co.
Templeton, Kenly & Co.
Tennessee Coal, Iron & Railroad Co.
Tide Water Associated Oil Co.
Timken Roller Bearing Co.
Tool Steel Gear & Pinion Co.
Bertrand P. Tracy Co.
W. S. Tyler Co.
Tyson Roller Bearing Co.
Union Carbide & Carbon Corp.
United Engineers & Constructors Inc.
United States Bureau of Mines
United States Steel Corporation
Universal Lubricating Co.
Utility Mine Equipment Co.
Universal Atlas Cement Co.
Viking Manufacturing Co.
Watt Car and Wheel Co.
Webster Manufacturing Co.
Weir Kilby Corp.
West Virginia Rail Co.
Western Cartridge Co.
Westinghouse Electric & Mfg. Co.
H. Kirk White & Co.
Wilson Welder & Metals Co., Inc.
Wood Preserving Corp.

PERSONALS

A. B. BROOK, official of the Elk Horn Coal Corporation, Wayland, Ky., was named president of the Big Sandy Elk Horn Coal Mining Institute for the coming year at the monthly dinner meeting of this organization at Pikeville.

HOWARD R. ELLIS, who has been divisional manager of the Safety Mining Company for the Rocky Mountain States, has been transferred to Benton, Ill., from which point he will cover the Illinois, Indiana and Western Kentucky fields for this company. Prior to his connection with the Safety Mining Company, Mr. Ellis was connected for 15 years with the Utah Fuel Company, with headquarters at Castle Gate, Utah.

E. C. MAHAN, president of the Southern Coal and Coke Company, and SENATOR WATSON, head of the Elk Horn Coal Corporation, have been vacationing at Hot Springs, Ark.

GEORGE W. MCCAA has been named superintendent engineer assistant at the Docena coal mining operations of the Tennessee Coal Iron and Railroad Company, effective February 1. Mr. McCaa was formerly employed by the Pittsburgh Coal Company in their engineering department.

H. E. LEWIS, chairman of the board of Jones and Laughlin Steel Corporation, has been made president of the corporation, succeeding S. E. HACKETT, who has resigned as president, director and member of the executive committee. Mr. Lewis will continue as chairman.

At the same time announcement was made by the Jones and Laughlin Steel Corporation that LEWIS M. PARSONS has been elected a director of the corporation and vice president in charge of sales, effective March 1.

Resignation of Mr. Hackett follows his association with the company since 1916.

ROBERT LEPSOE, of the research staff of Consolidated Mining and Smelting Company, at Trail, British Columbia, was awarded the platinum medal of the Canadian Institute of Mining and Metallurgy on March 15. Established in 1933 in observance of the 50th anniversary of the Canadian nickel industry, the platinum medal is awarded by the Council of the Institute from time to time "as a mark of distinction and recognition to the person who made a meritorious and practical contribution of outstanding importance to the mining and metallurgical industry of Canada." It was awarded Mr. Lepsoe "for his work in the recovery of sulphur dioxide from smelter fumes and its conversion into sulphuric acid, elemental sulphur, and various useful salts." SCOTT TURNER, formerly Director of the U. S. Bureau of Mines, in Washington, presented the medal on behalf of the Institute, of which he is a member.

N. P. RHINEHART has been reappointed as chief of the West Virginia Department of Mines, his new term expiring December 31, 1941.

CHARLES W. RAUSCH has recently been appointed advertising manager of Marlin-Rockwell Corporation, Jamestown, N. Y., succeeding A. A. MCGOWEN, who died October 28. For the past 10 years Mr. Rausch has been manager of the technical publications department of that company, and for the 10 years preceding he had also been identified with the same company in their engineering department.

WILLIAM B. REED has been appointed chief of the Cost and Sales Realization Division of the Bureau of Research and Statistics, the National Bituminous Coal Commission. With his appointment on March 11 Mr. Reed took immediate charge of the work of determining production costs.

Mr. Reed will be associated on the staff of the Commission with DR. W. H. YOUNG, former economist of the Bureau of Mines, and THOMAS HUNTER, who is in general charge of administrative statistics for the commission.

JOHN T. FALLON, for the past 10 or 11 years superintendent of the Omar No. 4 and No. 5 mines of the West Virginia Coal and Coke Corporation, has been made superintendent in charge of operations of the mines in the Elkins Division of the corporation at Norton, Junior and Bower, W. Va. He succeeds W. S. WILSON, resigned, and assumed his new duties on March 1.

E. A. COLLINS, assistant to the general manager, International Nickel Company, was elected president of the Canadian Institute of Mining and Metallurgy for 1938 by fellow members of the Institute in session in Toronto at their 38th annual meeting on March 17. Mr. Collins succeeds the HON. MICHAEL DWYER, Minister of Lands and Mines of Nova Scotia, in this position.

KEMP G. FULLER has been appointed manager of market research and sales statistics, United States Steel Corporation of Delaware, with offices at 436 Seventh Avenue, Pittsburgh, Pa. He was formerly manager of market research and sales statistics for Carnegie-Illinois Steel Corporation.

J. O. SMITH has resigned as Director of the Industry Relations of the National Bituminous Coal Commission. Pending appointment of his successor by the Commission, the Bureau will be in temporary charge of NEWELL W. ROBERTS, acting chief of the Special Industry Relations Division.

GEORGE H. BUCHER, executive vice president of Westinghouse Electric and Manufacturing Company, has been elected president of that organization. FRANK A. MERRICK, president since 1929, has been elected vice chairman, and PAUL J. MYLER, president of Canadian Westinghouse Company, was elected a director.

ELI B. PITTS, manager of the Tennessee Coal Iron and Railroad Company's Enslie, Ala., mercantile store and an employe of the company for 52 years, retired from service on March 1.

P. N. GUTHRIE, JR., has resigned as president of the Reading Iron Company, according to a recent announcement of Ralph E. Taggart, president of the Philadelphia and Reading Coal and Iron Company.

RICHARD FAULL, mechanical engineer of the ore mines and quarries division of the Tennessee Coal Iron and Railroad Company, was awarded a gold medal on February 12 in recognition of 50 years' service with the United States Steel Corporation. Mr. Faull is credited with the development of many important factors in the mechanization of the ore mining industry.

H. G. WASHBURN, general manager of the Federal Mining and Smelting Company, Wallace, Idaho, is the new chairman of the Columbia section of the American Institute of Mining and Metallurgical Engineers. JAMES L. LEONARD, Spokane, was named vice chairman, and L. K. ARMSTRONG, Spokane, was reelected secretary-treasurer.

WILLIAM D. TODD, former vice president of Jones and Laughlin Steel Corporation, Pittsburgh, has been selected foreign representative of the Steel Export Association of America, with headquarters in London. Mr. Todd succeeds JOHN O'OUTWATER in this position.

JAMES F. MCCARTHY, president of the Hecla Mining Company, recently stopped in Washington following a trip through the Panama Canal and a brief stay in Cuba. He has now returned to his duties in the Coeur d'Alene district of Idaho.

A. D. CHISHOLM, general manager for Pickands, Mather and Company, in Duluth, is on a European trip, accompanied by Mrs. Chisholm.

— *Obituaries* —

ALLEN HASTINGS ROGERS, senior partner in the consulting engineering firm of Rogers, Mayor and Ball, and a former president of the Mining and Metallurgical Society of America, died February 14 in New York City after a brief illness. Mr. Rogers, whose home was in Brookline, Mass., and who came to New York weekly on business, was 66 years old.

Following 16 years of mining work in Arizona, Montana, and Mexico, he became a consulting mining engineer in 1906. Companies he aided in the period from that year until 1917 included the Chino Copper Company, Nevada-Utah Company, L. Vogelstein and Company, and the Canada Copper Company. In 1917 the firm of Rogers, Mayor and Ball was organized.

He was a director of the Rio Blanco Corporation, and the Newfoundland Exploration Company, and was the author of many papers on mining engineering and geophysical prospecting.

CLARENCE S. WARD, prominent New River coal man, died at his home in Charleston, W. Va., February 5 of a heart ailment at the age of 57. For the last 19 years Mr. Ward had been a resident of Charleston and was associated in business with Thomas Nichol. Their business included the Beechwood and Turkey Knob Coal Companies.

VICTOR E. SULLIVAN, dean of the West Virginia mine inspection corps when he was retired 10 years ago, died at his home in Charleston March 12 after a brief illness at the age of 83.

Mr. Sullivan, who was father of Jesse V. Sullivan, secretary of the West Virginia Coal Association, suffered a paralysis attack last fall, since which his health has failed. He had been actively engaged until 1915 in coal mines in Fayette and Raleigh Counties, and was active in political circles, having served as chairman of the Raleigh County Republican Committee for four years, and represented that county in the house of delegates from 1915 to 1917. In the latter capacity he was a member of the committee that recommended the establishment of the school of mines of the West Virginia University.

"Daddy" Sullivan, as he was known to mine executives, was appointed a district mine inspector in the administration of Governor Cornwell. He served in the department under Earl A. Henry, J. W. Heatherman and Robert M. Lambie until his voluntary retirement. While he was stationed at Morgantown he founded the Monongahela Valley Mining Institute.

WINTHROP C. NEILSON, a vice president of the Aluminum Company of America, died at his Ardmore, Pa., home on March 12. He was 60 years old and had been in failing health for more than a year.

Mr. Neilson held his present office since 1931, but was concurrently president of the Republic Mining and Manufacturing Company, a position which he occupied since 1906, when he succeeded his father. The company, then independent, subsequently became a subsidiary of the Aluminum Company. Beside his activities in the Aluminum Company and in the Republic Mining and Manufacturing Company, Mr. Neilson held offices and directorates in a number of other companies, such as the Clinton Mining Company, the Righter Coal and Coke Company, the Brookside-Pratt Mining Company, and the Keystone Drop Forge Works.

HOWARD S. STEBBINS, 75, retired iron ore sales representative of the M. A. Hanna Company, Cleveland, died February 17 in Clearmont, Fla., where he was spending the winter. Mr. Stebbins, born in Masonville, N. J., went to Cleveland as a boy and started in the iron industry in his twenties. He was associated with Oglebay, Norton and Company until 1915, and was ore sales representative for the M. A. Hanna Company, retiring in 1931. Former treasurer of the Lake Superior Iron Ore Association, Mr. Stebbins also was a member of the American Iron and Steel Institute and the American Institute of Mining and Metallurgical Engineers.

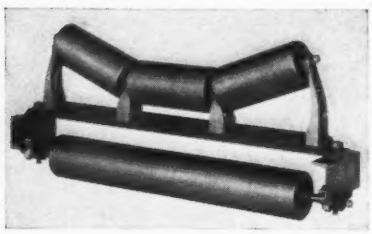
ELMER A. ANTHONY, well known coal operator in Logan County, W. Va., died March 4 in Ironton, Ohio, at the age of 56. Mr. Anthony had been in ill health since last November, but was critically ill for only a week preceding his death. Mr. Anthony was vice president and general manager of the McCall Coal Company at Christian, and vice president of the Wilson Consolidated Coal Company at Logan.

With the MANUFACTURERS

New Jeffrey Belt Idler

A new inexpensive ball-bearing belt idler for carrying moderate loads of semi- and non-abrasive materials is announced by the Jeffrey Manufacturing Co., Columbus, Ohio. This idler is of the conventional 3-pulley, 20 deg. troughing type, made for 14, 16, 18, 20, 24, 30, and 36-in. belts. Its ball bearings are of the commercial type, with a cork seal within a pressed steel labyrinth dust cap.

Pulleys are of 4-in. diameter welded steel pipe with formed steel gudgeons



welded in the ends. These gudgeons are connected within the pulley by steel tubing which prevents the loss of grease into the pulley proper. Shafts are ⅝-in. seamless tubing and are held by set screws within machine bored holes in the stands. As these shafts are hollow, the entire idler may be lubricated from either end through pressure fittings. Base angles are inverted to shed material.

Cleaning Plant Awarded Koppers

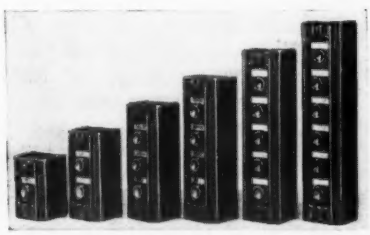
Koppers-Rheolaveur Company, a Koppers Company affiliate, has just been awarded a contract by the Franklin County Coal Corporation to construct a mechanical coal cleaning plant adjacent to the tipple at the corporation's Royalton Mine No. 7, Royalton, Ill. It is to be ready for operation by August 1, this year.

The cleaning plant will have a rated feed capacity of 270 tons per hour and will contain cleaning units that are new to the Illinois coal fields. The plant will operate in two shifts. A Koppers-Menzies Cone Separator will clean 3-in. x 5/16-in. coal on the first shift and 2-in. x 5/16-in. coal on the second shift. Two Koppers-Battelle launder units operating in parallel will clean 5/16-in x 0-in. coal on both shifts. Two Carpenter Centrifugal Driers will dry the latter coal. Provision is made for screening the washed coal and again mixing as desired.

Heavy Duty Push Buttons

Westinghouse type HD push buttons for a.c. and d.c. control circuits are designed for heavy duty service where dependability is of the utmost importance.

There are eight different units, including lamp receptacle and rotary selector switches, which may be grouped together in desired combinations to meet practically all application requirements. A distinct advantage is that all units have interchangeable counting dimensions. The units are suitable for built-in control or for panel mounting. Each unit is entirely self contained and requires no additional insulation for mounting.



Push-button stations of one to seven units are available in attractive heavy drawn steel cases with black baked enamel finish, with etched chromium plated legend plates for each unit.

The standard enclosure has a cover consisting of the top and sides in one piece, giving full accessibility for wiring or inspection when the cover is removed. Flush plate mounted stations are also available for mounting on panels, or for mounting over a recess in a machine where built-in control station is desired. With either type of station the cover is recessed so that the push button is effectively shrouded against accidental operation but there is no interference to operation with a gloved finger.

A chromium plated safety latch, with provision for padlocking, may be furnished with any unit to hold a circuit open. This latch is usually used to lock a controller "safe," but can be used to set up an "inching" circuit.

Indicating lamps used with type HD push buttons have excellent visibility, and can be mounted in any position in a push-button station as the mounting dimensions for the receptacle are interchangeable with the HD units.

Other features include heavily silver plated double break contacts, stainless steel springs for both the main spring and the moving contact spring, and a general heavy duty design for maximum dependability under the most severe operating conditions.

The push buttons are fully described in a bulletin recently issued, copies of which may be obtained from the nearest district office or direct from the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Watts Promoted by Allis-Chalmers

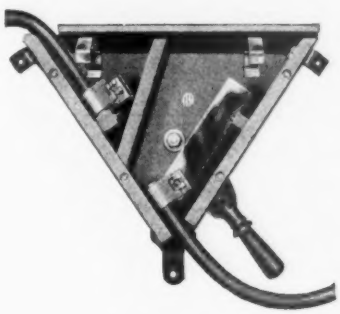
Leon A. Watts has been appointed to succeed the late Samuel Moore as General Superintendent of Allis-Chalmers Mfg. Company's Service and Erecting Department. He joined that Company in 1903 and during his many years of shop and field service experience has handled practically every line of equipment built by that organization, including many of the larger steam and hydro-electric power units, cement mill equipment, mining and electrical machinery. In 1924 he was stationed at Atlanta, Ga., after having been appointed District Super-

intendent of Service and Erection for the southeastern section of the United States. In 1935 he was transferred to Milwaukee as assistant to Mr. Moore, whom he now succeeds.

Safety Feeder Switch

A new, inexpensive, low-capacity feeder safety switch has been designed by the Ohio Brass Company, Mansfield, Ohio, to displace open type knife switch installations in mines and industrial plants.

The switch is of the quick-make, quick-break type, for 250-600 volts and is furnished in 300 and 400 ampere sizes. Enclosed in a fire-proof case it affords a safe means of disconnecting the circuit under load without danger to the operator or damage to the switch. A heavy rubber handle provides further protection. The action of connecting or disconnecting the switch is instantaneous, and the quick-make feature insures a positive contact when the switch is closed.



Motorization Improves Incline Operation

Elimination of wrecks and delays has in less than two years saved the cost of motorizing the inclined plane used to lower coal from the dumphouse to the railroad tipple at the Bonny Blue Mine in Virginia. In addition the motor, which acts as a generator most of the time that the incline is in operation, returns about 550 k.w.h. to the mine power lines daily, thereby cutting power costs.

At this mine, which is operated by the Blue Diamond Coal Company, there is a difference in elevation of 950 ft. between the dumphouse and the tipple at the railroad tracks. To lower the coal economically an inclined plane using two monitor cars in balance is used. The cars are connected to each other by ropes which pass around a double pulley arrangement at the top of the incline, the loaded car descending the grade furnishing the power to pull the empty car up the grade. The average grade on the incline is close to 14 percent, although it varies from a minimum of 6 percent to a maximum of 27 percent.

Before the incline was motorized operation of the system depended entirely on gravity. While the grade was steep enough to keep the loaded car moving at all times, the system would stall when the loaded car was on a part of the plane where the grade was slight and the empty car was on a steep part. To prevent such stalling in "load flats," it was necessary to let the cars run at speeds as high as 3,000 ft. per minute. At this speed wrecks and delays were frequent and expensive. For emergency "spotting" and other unusual conditions, it was necessary to connect a 150-h.p. motor temporarily to the pulleys at the top of the incline.

To make possible a more nearly constant speed and to provide a better means of controlling the cars, a General Electric type MT motor, 600 h.p., 2,200 volts, was connected to the pulley mechanism. When the loaded car is on the steeper parts of the profile, the motor acts as a generator and furnishes regenerative braking to limit the speed of the system. When the gravity force is not sufficient to keep the cars moving at about 1,750 ft. per minute, the motor furnishes enough power to keep up the speed.

During the part of the run when the motor is driving the cars it takes 300 h.p. from the line and when acting as a regenerative brake it restores a peak of 1,200 h.p. to the line. Arrangements have been made for "plugging" the motor to stop the cars at the end of the run.

A six-point, cam-operated General Electric master control switch provides a selection of speeds. Current limit relays are used to govern the closing of the accelerating contactor when the controller is thrown to full running position instantly. Either over speed or voltage failure causes a solenoid valve to operate the air brakes and prevent the monitors from running away.

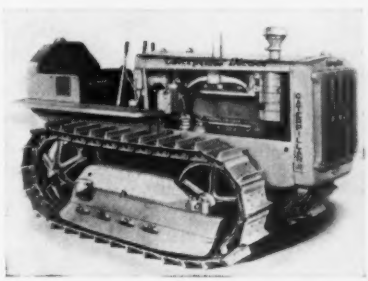
There have been no wrecks on the incline since the motor was installed and the savings brought about by the elimination of wrecks and delays has more than repaid the cost of the motors and control, according to engineers of the mining company. Control is better at all times and it is not necessary to put new blocks in the air brakes so frequently. Operators of the system are freed from worry and the fear of having wrecks.

New Small Caterpillar Diesel Tractor

Bringing diesel economy in a practical size to thousands of new tractor users, Caterpillar Tractor Co. has announced the Diesel D2, smallest of the current "Caterpillar" diesel tractor line.

Ideal for the hauling of supplies, as well as working the smaller rotary scrapers, or maintaining and building mine roads, the new tractor works, when conditions are average, on only 1¼ gallons of low cost fuel. This compared with two gallons of gasoline or distillate, which the most efficient spark-ignition machine of similar size will burn.

The new tractor has a four cylinder, four stroke cycle engine, which develops 25.5 horsepower at the drawbar, and 31.5 horsepower at the belt. There are only three engine operating adjustments to be made—the water pump, the valve clearance and the fan belt.



A unique feature of the Diesel D2 engine is the twin radiator, which was developed by "Caterpillar" engineers. One is for cooling the water, and the other, for cooling the lubricating oil, thus insuring longer life for the engine bearings.

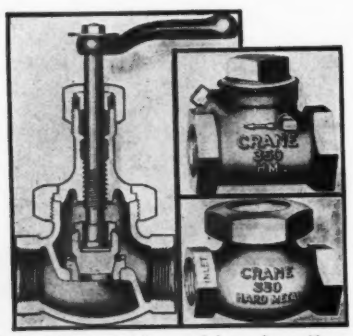
A hot water manifold on the front side of the fuel filter housing is an interesting all-weather feature. This keeps the Diesel fuel at the proper temperature, regardless of climatic or operating conditions.

Fuel savings of from 60 to 80 percent are expected with this new tractor, as has been the case where larger diesel tractors have replaced similar size spark-ignition machines.

Brass Valves for 350 Pounds Steam

A new line of brass screwed end globe and check valves for 350-lb. steam pressure at 550 degrees temperature is being offered by Crane Co., Chicago. These valves are designed especially for high pressure steam lines such as are used on oil and gas field boilers for deep well drilling operations. They also may be used on non-shock cold water, oil or gas lines up to 1,000 lb. Their sizes range from ½ in. to 2 in.

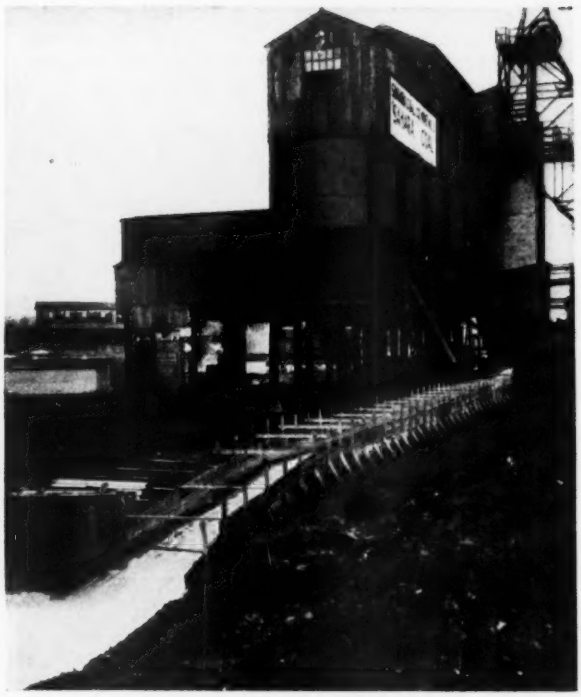
The globe pattern brass valve (62-P) is of the union bonnet design (except the 2 in. which has a bolted bonnet) and has Crane nickel alloy plug type disc and Exelloy body seat ring. The stuffing box is supplied with a gland and is filled with high grade packing which may be replenished when the valve is wide open and under pressure.



Left—350 pound brass globe valve. Upper right—350 pound brass swing check valve. Lower right—350 pound brass lift check valve

The horizontal lift check valve also has a union bonnet except the 2 in., which has a bolted cap. Discs are of the piston-guided type and seats are renewable screwed in rings of Crane nickel alloy. The horizontal swing check valve (No. 78-E) which may be used either for horizontal or upward flow, has screwed cap and tapped hole in the body to facilitate regrinding of the disc.

In order to have a companion line of brass gate valves for this same service, a 350-lb. steam rating at 550 degrees F. has been added to the regular Crane No. 230-H brass gate valves.



12,000 gallons per minute discharge from dewatering operation at Sahara Coal Co. mine, Harrisburg, Ill.

Pumps Reclaim Flooded Mine

Pumping 3,000,000,000 gallons of water at a rate of 12,000 per minute is the job of a battery of pumps in reclaiming a coal mine that had been inundated in the flood of 1937.

The flood had been a major disaster to the town of Harrisburg, Ill., as the flooded mine, owned by the Sahara Coal Company, was a main source of employment. With the help of WPA funds, the State Department of Mines and Minerals bought three 3,000 gallon Pomona pumps, driven by 500 h.p. Westinghouse motors. The contract called for delivery of the machinery through the Stewart Machinery Company, at St. Louis, in 93 days, but Director James McSherry, Department of Mines and Minerals, threw the control switches and started the pumps to work two weeks before the time was up.

The pumps were designed to carry a 25 percent overload, and as a result water was removed at the rate of approximately 12,000 gallons per minute. In the first 20 days the level dropped 46 ft. and at that time 345,600,000 gallons of water had been removed from them.

State officials predict that the pumps will more than pay for themselves in providing employment for miners in reclaimed mines and in the conservation of the state's mineral resources.

Westinghouse Forms Three Industry Departments

To serve industry better, the Westinghouse Electric and Manufacturing Company has announced a realignment of the Industrial Department. Three new departments—Industrial, Resale and Industry Engineering—have been formed to meet the changing conditions in industrial markets.

The new Industrial Department, with a staff of field trained sales engineers each of whom has had broad experience with industry problems, is headed by C. B. Stainback, who was formerly assistant manager. Managing the Mining Section of this department is J. S. Parry, Jr., who has been associated with Westinghouse sales work since his graduation from Princeton in 1920.

The Resale Department, of which Bernard Lester is now manager, will devote its facilities to servicing manufacturers whose products incorporate electrical equipment, and other secondary distribution channels such as

industrial agents and jobbers. W. D. Turnbull, manager of machinery electrification in this department, will head the development and handling of company business with machinery manufacturers, the same responsibilities he held under the former department. Mr. Turnbull has been with the company since his graduation from Pennsylvania State College in 1923.

Backing up both departments with application engineers, the Industry Engineering Department under the managership of C. A. Powel, will provide a corps of engineers experienced in the electrical problems of the several industries. Phelan McShane is manager of the Mining, Chemical and Petroleum Section of this department.

These departments are all located at the company's East Pittsburgh, Pa., offices.

McDonald Safety Hats

A new model of the McDonald Safety Hat—known as type "T"—combining maximum strength with cool, lightweight wearing comfort, and made of duralumin (airplane metal), is now marketed by the Mine Safety Appliances Company, Braddock, Thomas & Meade Streets, Pittsburgh, Pa.

The duralumin shell, designed for the protection of workmen against falling or flying objects, is corrugated to provide maximum resistance to blows and does not absorb radiated

heat even when worn in sunlight. The genuine leather headband is spaced from the shell to assure continuous air circulation. Cradle-straps and headbands are easily and quickly interchanged or replaced. One-size shell for all head sizes simplifies stock requirements.

Descriptive literature on both types of McDonald Hats—the new type "T" and the type "X" which has a smooth crown and sturdy rubber brim—may be had by writing for bulletin DQ-1 to this magazine or the Mine Safety Appliances Company.

Talking Picture on Wire Rope

Every once in a while there is seen some outstanding bit of advertising. Sometimes it is pictorial, sometimes statistical, sometimes technical, and sometimes constructively educational.

In the last-named class is the new talking moving picture depicting in detail the complete processes of drawing high carbon rope wire, and fabricating wire rope, as produced by the Union Wire Rope Corporation, of Kansas City, Mo. This interesting and instructive picture is designed for presentation before groups in the building and construction, mining, logging, oil and other industries in which wire rope is extensively used.

CATALOGS and BULLETINS

• BEARINGS. *Boston Gear Works, Inc.*, North Quincy, Mass. Booklet presents practical data and characteristics of complete line of Oilite bronze bearings. 16 pages.

• CABLES. *Anaconda Wire and Cable Co.*, 25 Broadway, New York City. Publication C-39 presents a general description of the characteristics of "ANW" cable, together with its use in industrial applications and large buildings. 8 pages.

Publication C-41 is a carefully prepared study on the correct uses of Anaconda Cambric Cable, and its various physical properties and characteristics. In addition, there is a series of new tables relating to recommended thickness of insulation, tests and new current capacities data for use of this cable in both air and ducts. 36 pages.

• CLIP FOR TRACK EQUIPMENT. *Carnegie-Illinois Steel Corp.*, Pittsburgh, Pa. Sheet presents brief description of the new USS No. 2 clip, for use with mine track equipment.

• DIESEL ELECTRIC GENERATORS. *Caterpillar Tractor Co.*, Peoria, Ill. Form 4658 describes a wide range of uses for Diesel powered electric generator sets, and gives rating of the 8 sizes of the "Caterpillar" powered generator sets now available. 12 pages.

• ELECTRIC DRIVE SELECTOR. *Westinghouse Electric & Mfg. Co.*, East Pittsburgh, Pa. "Electric Drive Selector and Hints on Maintenance" describes and illustrates the requirements which must be met in selecting a motor, and is arranged particularly for the non-technical or for the plant maintenance man. 12 pages.

• ELECTRICAL EQUIPMENT. *General Electric Company*, Schenectady, N. Y.

GEA-1587C describes combination magnetic switch. 4 pages. GEA-2635 and 2011A publicize types and uses of recording instruments. GEA-2473 describes push-button stations and other manual electric controls. 12 pages. GEA-2776 presents information on the gasoline-engine-driven arc-welder. 4 pages. GEA-2778 describes type AL-2 air breaker equipments for low voltage A.C. circuits. GEA-2638 presents features of plugs and sockets for storage battery locomotives. GEA-1590C describes oil immersed magnetic switches for insulation in corrosive atmospheres.

• ELECTRODES. *The McKay Company*, Pittsburgh, Pa. Folder describes complete new line of shielded-arc welding electrodes now to be marketed on a national basis.

• EYE PROTECTION. *American Optical Co.*, Southbridge, Mass. Folder presenting a chart which specifies types of safety goggles to wear for protection against eye hazards in all principal industries. 4 pages.

Mine Safety Appliances Co., Pittsburgh, Pa. Bulletin "Eye Protection" describes and illustrates eye protective equipment of every type and design used by workers in a great variety of industrial fields. 8 pages.

• MOTOR GENERATORS. *Allis-Chalmers Mfg. Co.*, Milwaukee, Wis. Bulletin 1155A illustrates modern construction of motor generator sets for various applications such as in steel mills, mines and other services. 20 pages.

• SHOVELS, DRAGLINES, ETC. *Bucyrus-Erie Co.*, S. Milwaukee, Wis. Bulletin FBE 17 discusses complete specifications and uses of the 17-B shovel, dragline, clamshell, etc. Bulletin FBE

19 gives complete description and uses of the 19-B shovel, dragline, etc. Bulletin FBE-33-B-2 discusses specifications and uses of the 33-B shovel, dragline, etc. Bulletins 21-W-2, 29-W-2, and 33-W-2 give complete descriptions of different types of water well drills manufactured by the company.

• SOLDERING TOOLS. *Ideal Commutator Dresser Company,* Sycamore, Ill. Folder describes the complete line of new models and heads of Thermo-Grip electric soldering tools.

• VIBRATING SCREEN. *The Deister Concentrator Co.,* Fort Wayne, Ind. Bulletin 1400-H presents the new improved Model C Leahy heavy duty vibrating screen, describing and illustrating its latest mechanical improvements, together with the fundamental characteristic principles of operation of this screen. 20 pages.

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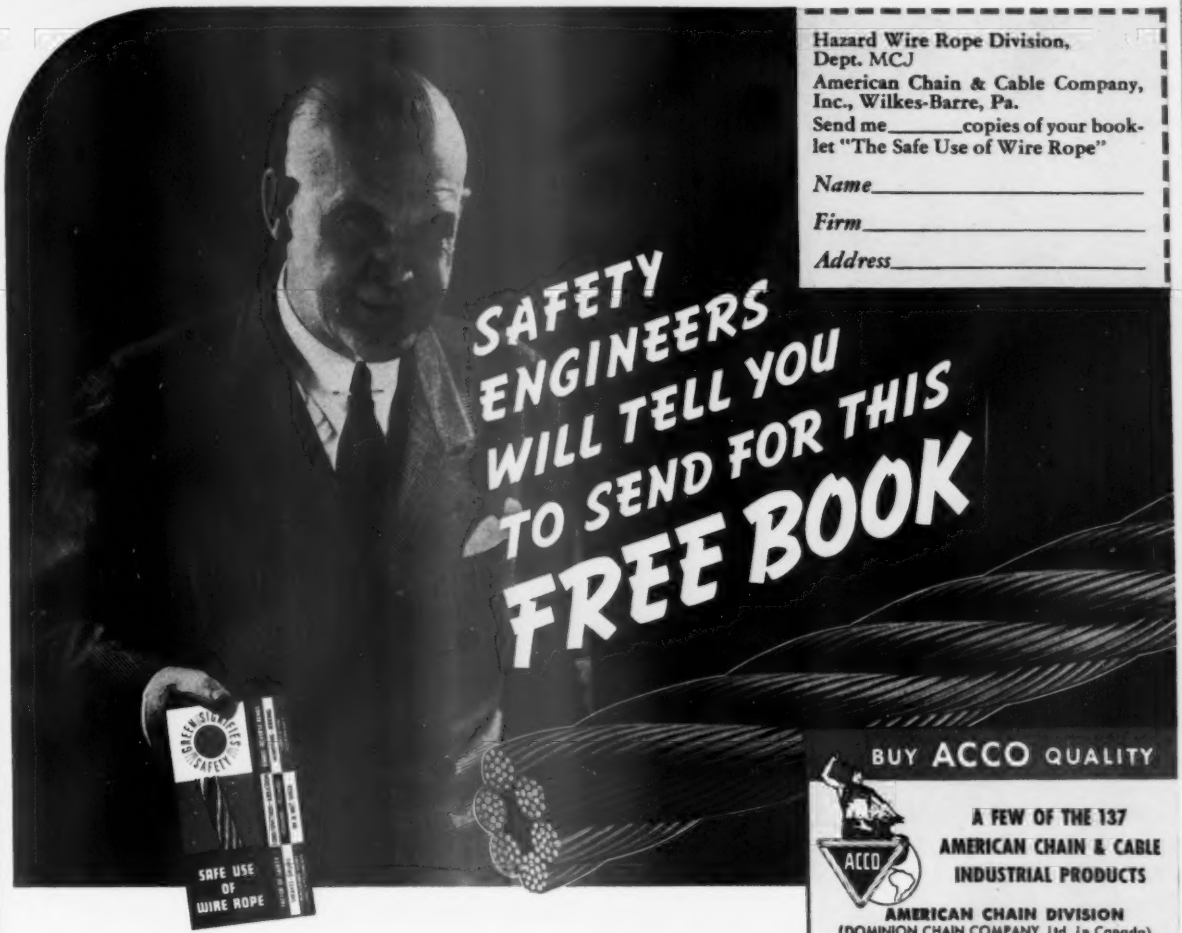

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